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MINING AND SCIENTIFIC PRESS.

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CALIFORNIA STATE

Copper.

The copper trade in England is beginning to feel the effects of the abundant yield of American mines. The policy of some of the large mining companies in announcing to the world their intention to increase their production, together with the report of negotiations pending for large quantities of copper matte to be shipped from this country to England this year, has borne its natural result, and the price of £50 has been reached for Chile bars in the Liverpool market. It seems apparent that some large mining companies cannot produce copper to a profit at the purity of £50 for Chilo bars, while the profits of others will be largely diminished. Possibly, if prices should fall much lower, some concerted actiou will be taken to limit supplies, in which case we may see an advance.

The following significant sentence occurs in the last report of James Lewis & Sons, the Liverpool ore dealers: "Arrivals from the United States have again been on a very limited scale —only 1,206 tons. On the other haud, the consumptive demand, especially for Birmingham, has fallen off. The competition of American and other ingot copper has materially affected the value of English best selected, and unless English smelters are willing to pay better prices for American ore and matte than they at present offer, we may look to see ere long chief part of tho American production arriving here in the form of bars and ingots, and India supplied direct with American sheet copper. The abstention of smelters from purchases of furnace material has been a noticeable feature during the month. Six thousand tons of Rio Tinto regulus, of abont 30 per cent, have, however, been sold for delivery here at the rate of 500 tons monthly, at a price based on that of Chile bars at the time of delivery, and a considerable quantity of American copper matte for forward delivery at 10s. per unit."

The arrivals in Liverpool from Chili, in November, were 2,149, and deliveries 1,624; and from other countries 3,080 and 3,019 tons respectively. From the United States in the same month there was received 1,206 tons of fine copper, consisting of 521 tons of bars, 89 ingots, 282 matte, and 1,797 tons of ore. Chili exports up to Dec. 1st, for the year, equal 42,150 tons of fine copper, and stocks of West Coast products on haud are 23,413 tons fine. Stocks of other than Chili, produced 8,921 tons. The total month's supply is 44,624 tons. From the United States they have received for the first eleven mouths this year, at Liverpool and Swansea, 15,851 tons of fine copper.

REMOVALS.—Several prominent firms are changing their head-quarters with the new year. The Judson Manufacturing Company are removing to Nos. 8 and 10 Pine street. John Taylor & Co., dealers in assayers' goods, chemicals, etc., are about to take possession of the fine new building Nos. 114, 116 and 118 Pine street. The California Wire Works will, about January 15th, move to the southeast corner of Fremont and Market streets.

AMONG the recent shipments of the Dean Bros.' steam pump works, Indianapolis, Ind., were two large steam pumps having 20-inch steam cylinders, 14-inch water cylinders and 24-inch stroke. One went to Muscatine, Iowa; the other to the Cloquet mine. Each pump can deliver 1,600 gallons per minute.

Lead Smelting.

Lead smelting can be conducted most economically at a point where ores of a different character find a joint market, and where, at the same time, railroad facilities enable the smelter to obtain his fuel, flux, etc., and ship his product at low freight rates. But in such places—of which Leadville is one—it takes skill to purchase ores in suitable proportion to flux each other, and large smelting capacity to make the enterprise profitable. In Leadville the increase of capacity reduced the cost of labor about one-half. For instance, at Leadville in 1879, when the railrosd was 35 miles off, charcoal was 14 cents per bushel of 14 pounds; coke, $30.70 per ton; in 1882 charcoal, 10½ cents, coke, $15. In 1879 average cost of fuel for ton of ore was $8.92; in 1882, $5.66. The cost of labor when they had two 42-inch furnaces was $5.20 per ton, and when they had five large ones was $2.79 per ton.

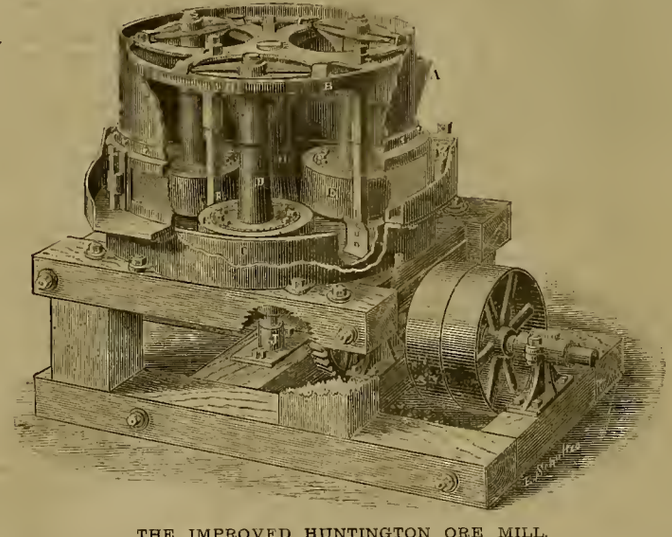
This shows that large capacity materially decreases cost of labor. There is a growing tendency to establish smelting works at more central points, where competing railroads intersect, like Denver, Pueblo, etc., where extensive works have been put up. On this coast we have only had one smelting works of note—the Selby Works in this city. The company owning them are now putting up more extensive works on the line of the Southern Pacific and Central Pacific Railroads, near Port Costa, at a point where deep-water ships can come alongside the wharf or front, and the railroad track is in the rear. It is understood that the new plant of the Selby Company will he more extensive and of greater capacity. Many improvements are being made. The works will afford a fine place for the marketing of the ores of this coast.

MUCH interest was excited in New Orloans by the unloading of the famous silver brick from Mexico. A gang of men, equipped with pulleys and ropes, dragged the monster across the main building, between the files of admiring visitors. The brick is six feet long and three and a half feet wide and six inches thick. It is of solid silver and valued at two hundred thousand dollars.

The Huntington Mill.

The Huntington roller quartz mills have now been on the market some little time, and have been put through the test of practical experience pretty thoroughly. The inventor has made several improvements since the mill was designed, and the engraving on this page shows it as now made. He now uses a rolled steel ring and die, and rolled steel roller rings. He has experimented with different sizes, from three to five feet in diameter, and finds the three and a half feet mill the best.

The engraving shows a part of the pan broken away, so the mechanism can be seen. E represents the rollers, which have cylindrical shoes surrounding them, which may be replaced when worn out. These rollers have vertical shafts, D, and these shafts extend up through



THE IMPROVED HUNTINGTON ORE MILL.

sleeves, on which they are fitted to turn. The sleeves have horizontal trunnions, which turn in boxes on the frame, B, which is keyed to a central shaft, G. Scrapers F serve to cut the material from the bottom of the pan, so the rollers do not touch the bottom, so that it will be carried between the roller and annular die C, until it is ground fine enough to pass through the screen. The rollers are allowed to swing to and fro from the center of the pan, and when the frame, B, is rapidly rotated, the rollers are thrown outward by centrifugal force against the die, C. The ore is fed in through the hopper, A.

Within the last week Mr. Huntington has sold five of these mills. Geo. W. Bothwell, of Lewis, Nev., who has been using one mill has purchased another, which is a practical endorsement. The Paradise Valley Mining Company has purchased three mills; and Shugart & Morgan, Jackson, Amador county one. Messrs. Fraser & Chalmers, of Chicago, are now manufacturing theso mills east of the Rocky Mountains. Mr. Huntington himself makes them on this coast.

THE Utah Mine on the Comstock has been shut down because there are not funds enough in the treasury to pay expenses of current month. Only such work as is necessary to preserve the property of the company is being done.

Abandonment of Mining Claims.

The provisions of the U. S. mining laws, which require annual expenditures on mining claims, are not well known to miners. If the required expenditure is not made within the specified time, or work commenced after the failure and before relocation, the claim is open to relocation the same as if no previous location had ever been made. The period within which the work must be done begins on the first day of January, succeeding the date of location, and each year after that (until patent issues) certain work must be done in order to keep the title clear. The courts have decided that the failure to perform work on a claim required by usual laws or regulations amounts to an abandonment, and thereupon it may be occupied and appropriated by another. In its common law sense, abandonment is purely a question of intention. An abandonment takes place when the ground is left by the locator without any intention of returning or making any future use of it, independent of any mining rule or regulation.

Although since the laws requiring annual expenditures have been passed, there is not so much doubt of the question of abandonment as before, yet claims are sometimes virtually abandoned long before the end of the year when more work must be done to retain ownership. In a case of this kind, however, the Courts have decided that to support the plea of abandonment there must appear from the evidence that there was a leaving of the claim, without any intention of returning or making any further use of it; and it is competent for the opposite party to prove, on rebuttal, any acts explanatory of the leaving which tend to show that it was not accompanied with an intention not to return. Abandonment is a mixed question of law and fact. If in fact, a person intends to give up his mining claim and quit paying assessments in pursuance of that intention, it is an abandonment in fact. The Courts have decided also that when an abandonment takes place a vacancy on the possession is created, and without such a vacancy no abandonment can take place.

Abandonment is a word which has acquired a technical meaning, and there is no reason why it should receive a different signification when applied to a mining claim than that which it has received in the books. As stated, there was formerly considerably litigation over this subject, though now, happily, if a man does not do his annual assessment work, the law considers he has abandoned the claim, and any one can take it up.

A party relocating an abandoned mining claim may sink new shafts, or continue work on such as may have been abandoned. The party abandoning, however, has the right to remove any ore he may have extracted, or any machinery or buildings he may have placed on the claim. Where an alleged abandonment occurred subsequent to the publication of the notice of application for patent and prior to the payment and entry, the Land Office would be compelled to take jurisdiction. Where adverse locations are made prior to the application for patent, controversies as to right of possession growing out of such relocations must be adjudicated by the Courts.

QUICKSILVER has advanced in Liverpool to £6 5s. and £6 15s. per flask.

CORRESPONDENCE.

We admit, unchanged, opinions of correspondents.—EDS

Mining at Tuscarora, Nevada.

[From our Traveling Correspondent.]

In comparison with other districts of the State, Tuscarora may be put down as one of the liveliest. Two or three mines are making large bullion shipments, aggregatiug upwards of $100,000 per month. One mine has recently commeuced paying regular monthly dividends, while another may be expected to resume payments at no distant day. The camp, within its ten years existence, has produced many millions of dollars—probably somewhere from six to eight—the exact figures not being at hand—and as many more millions, from present outlook, may be anticipated the next decade.

The Grand Prize.

At one time the leadiug mine of the place and the largest bullion producer, was located in 1875, but no work was done on it before the followiug summer. At that time it passed into the hands of Mr. Grayson, who forthwith commenced the erection of hoisting works and also a 10-stamp mill for ore reduction. Since that date the mine has yielded not less than four millions and paid $450,000 in dividends. Above water level to the depth of 180 feet, it contained a chloride ore in quantity and easily milled, whereupon a large 20-stamp mill was put up in immediate connection with the hoisting works. Below this point the ore changed to a sulphuret, when a furnace for roasting was erected. The three-compartment shaft was afterwards sunk to the depth of 780 feet and a 12-inch Cornish pump put in place to handle the water.

In June, 1883, the hoisting works were destroyed by fire, and the water rose to within 35 feet of the 400 level, where it seems to find an outlet. As nothing of permanent value was found at the deepest level reached, there appeared to be no good reason to justify the company in the erection of new hoisting works and the expense attendant on securing another pumping engine; so that the work has recently been wholy confined to the ground above the 400-foot level. The ledge formerly worked is understood to be an east and west veio, while the developments of rich ore have been made on a north and south ledge, running at right angles to the old workings. The vein has been worked up to 170 feet above the 400 station, and is represeuted to be large. It is producing 15 tons of ore per day, averaging about $175 per ton, and furnishing at present $14,000 per week for shipment.

Above the point just named, it is said to be all virgin grouud, and as it is reasonable to infer that the good ore will continue all the way up to the surface, there is yet an immense amount remaining to be extracted, so that the life of the mine bas yet a long lease, it is hoped, and may agaiu rival in production her best dividend payiug days.

The Navajo Mine.

Mr. W. C. Price, superintendent, probably stands next to the Grand Prize as to bullion yield to date, having turned out not less than $1,500,000, and paid as much as $275,000 in dividends. For some time past it has been the leading mine of the district, and is still somewhat in excess of any other in her monthly shipments, besides being on a very substantial basis financially. She assumed payment of monthly dividends of 25 cents per share to the stockholders in November last, and had a cash balance on hand Dec. 1st of $106,000. Her monthly shipments amount to $60,000, the ore at present milled, averaging $185 per ton.

During the fiscal year, ending Aug. 12th, the mill of 10 stamps, owned jointly by the Navajo and Independence companies, ran 227 days and a fraction, reducing 2,243 tons of Navajo ore in addition to some custom work; the average battery assay $104, working up to about 92 per cent.

The bulk of the ore was taken from the 450 foot level, and is said to be not yet exhausted. From the 150 down to the 650 foot, exploiting has gone on simultaneously with ex racting and reducing of ore for the past two years, and there is still a very considerable extent of new and undeveloped ground in nearly every level.

Only a few de ails can be giveo. A winze from the 150 foot sunk 50 feet, connecting with an upraise from the 250 foot level, encountered from one to two feet of chloride ore, giving sample assays from $300 to $700—a part of the vein going much higher. A crosscut to the vein 335 feet south of the Belle Isle line in connection with the developmen's of winzes, shows the value of the rock to he worth several hundred dollars per ton, and to carry from 20 to 30 per cent in gold. In drifting a few feet south the vein had widened to 5 feet, with three feet of ore that will work from $350 to $500 per ton.

From this level there are also 225 feet of backs. Although the ground cannot be said to have been explored, as all the ore bodies of the mine have iovariably extended to the surface, the superintendent is confident that the result will be altogether favorable.

Ore of good quantity and quality is reported on the east lateral vein of the 250-foot level, and on the 350, the ore, by assorting and concentrating, has been made to work up to $80 per ton, and it is understood that a large amount on this level remains to be extracted. From the explorations on the 550 and 650 levels the indications point to the striking of ore bodies similar in richness to those previously found in the mine.

Many important improvements have been made the past year about both mine and mill. A 20-inch Cope & Maxwell pump bas been placed in one of the lower levels, capable of handling any probable flow of water. In the machine shop there has been added an 18-foot lathe, drill press, and many other things essential for quick and economical work.

In addition to a number of much-needed buildings, there have been supplied to the mill a No. 7 Burleigh compressor and two large boilers. Also a 20,000 gallon tank with pipe, laid to furnish the mill with water.

The Independence.

under the same management as the Navajo, has had shaft No. 1., at the south end of the mine, sunk an additional 100 ft., besides a great deal other work in the way of exploration.

The shaft followed the vein all the way down, showing a fair width of milling ore. Perhaps the most important disclosure made during the past year, is the discovery of an east and west vein of good average size, the ore at first being somewhat irregular in grade, but growing richer as the work progressed. The last taken out is represented to be as good as the best ever extracted from the mine. The ground, particularly towards the west, and of this vein, gives promise of a better day about to dawn on the mine.

The Belle Isle and North Belle Isle.

The present prospecting work in the Belle Isle mine proper, is developing some good ore, and its future outlook is thought to be flattering.

Her bullion product has reached the neighborhood of $750,000, and her dividends have amounted to $300,000.

The North Belle Isle

Has encountered another ore body, that so far as developed, promises a good output at no distant day, and possibly, a resumption of divideuds. From the brief notice here given, it must be evident that the mining camps of the State are few and far between that can show at this time, a better record. Before closing, it may be well to state, that Tuscarora is favored with a good foundry, owned and run by Messrs. Jack and Dove. It has appliances for making castings up to 5,000 lbs. for all kinds of milling, mining and agricultural purposes. In addition to this, general machine, blacksmith and boiler work is done, together with repairing, besides carrying a large stock of second-hand machinery to supply the wants of the district. A. C. K.

Wood River Smelters.

The Idaho *Keystone* says: Since the middle of June, the time of starting this season, the Philadelphia smelters, with one 50-ton stack in operation, have made a fine showing, and afford an illustration of what can be done when the mines in the neighborhood are sufficiently developed to keep all four of the stacks in operation, which, no doubt, will be the case in the course of another season.

The competition in ore buying in the different towns on Wood River bas been brisk all season, and much of the product of our mines finds its way to different points East, aud also to San Francisco. The Philadelphia smelters have had one stack running since about the middle of June, with the exception of an occasional stoppage, incident to all smelters and mills. The output of bullion in that time demonstrates what could he done if the furnaces were run to their full capacity—180 tons per day. The plant consists of two 40-ton stacks and two of 50 tons each. The works are only second in size to one or two similar plants in the United States, and in many respects the advantages of the Ketchum plant are not equalled in the world. The surroundings are not excelled anywhere; water, timber, the natural advantages of location, being all that could be desired. As an ore center, also, it has no equal, of which Ketchum is the center of the largest and richest mineral field in the West, as acknowledged by mining men. The smelting arrangements are as complete as can he made by man, and every facility for operatiog the works successfully is at hand.

We took a stroll through the smelters a few days ago, and noticed the different changes the ore goes through before it comes out in white, sparkling bullion. The branch, or "Y" extension from the main railway track, is completed to within a short distance of the smelters, from which point a trestle will connect the road with the smelters.

Up to date, 104 cars of bullion have been turned out since the time above mentioued. A carload is 12 tons, or 240 bars of 100 pounds each. The grand total is about 1,300 tons of bullion, or in the aggregate 2,600,000 lbs., at an average of $300 per ton, or $390,000 in all, since June. The showing of bullion speaks well for the smelters and the camp, and gives a good idea of what the country will be able to do when our mines are better developed. Aside from the ores reduced by the Philadelphia smelters, over 1,000 tons of high grade smelting ores have been sold in Ketchum and vicinity during the past month and shipped to Salt Lake and other points.

Idaho's Mining Interests.

The following is an extract from the Governor's annual report to the Secretary of the Interior: —This Territory, rich in its practically boundless deposits of mineral wealth, has not developed as extensively within the past year as was expected. Many of our rich miuing districts are even now virtually idle. This much-to-be-deplored condition is occasioned by various circumstances and conditions. The more important of which are: The timidity of capital, lack of scientific knowledge on the part of the average miner and lack of practical experience on the part of the average expert. There are other difficulties in the way, which stand as insurmountable barriers to the rapid progress of mining in Idaho. The mining laws are imperfect. Mining interests need the strong hand of rigorous law to call back operations to the mines when they shall be real, instead of figuring upon the stock boards, where they are pretentious shams based upon the credulity of the people, which state of things is fast confounding the suppositions with the real, and has always worked to the great detriment of honest mining. If there were a school or system established that would bring about a happy medium between the unlearned miner and the theoretical expert, it would redound to the general good and to a considerable extent preclude the possibility of investors in mining being so often, so extensively and outrageously swindled by sharpers and company mongers.

Mining is our chief source of wealth, and employs in the Territory a greater number of men, despite all the drawbacks, and a greater amount of capital than any other industry. The development in gold and silver during the past year has been at a ratio of 50 per cent, the output of mineral wealth from the Territory being, as nearly as can be ascertained, $7,000,000. Idaho has greater mineral belts than any other Territory or State in the Union. The most extensive belt lies on the Western slope, and the spurs of the Rocky mountains that enter the Territory in Oneida county, and run the entire length of it to Lake Pen D'Oreille, a distance of 110 miles. The mines and discoveries on this immense belt, now being worked, begin in the Wood River country and extend to Coeur d'Alene. All that country on this belt lying between Sawtooth, in Alturas county, and Perce City, in Nez Perce county, is unexplored, and the time cannot be far distant when great riches will be unearthed from many parts of it. The districts that have attracted marked attention during the past year are the Wood River, Lost River and Coeur d'Alene.

The Wood River district is proving equal to the expectations of the most sanguine, and it is now generally conceded to be the richest silver-lead producing country in the world. The general average of the ores assays 143 ounces of silver and 63 per cent lead to the ton. This and the strength and number of the veins are sure indications of the great wealth of the district. In all cases the ore has steadily increased in value as depth has been attained, and the opinion largely prevails among men of acknowledged capacity in this branch of industry that, owing to the continuity of the ledges and the extreme width of the mineral belt, there will eventually be as deep mining in Wood River as in any other mining country in existence. The Bullion is the greatest belt in this locality, being from three to eleven miles in width, and has been explored from Bellevue to Smoky, a distance of thirty-seven miles. The next belt in importance is the Elkhorn. It extends from the East Fork of Wood River to Lake Creek, some nine miles. There is also the Muldoon belt, running from Muldoon to East Fork. The formation on the northeast sides of these belts is a granite porphyry, and on the southwest sides porphyry.

The veins occur in a metalliferous line shale, which is an easy guide to the practical miner. The output for the year ending June 30th was about $4,000,000.

SALTONA SALT WORKS.—In a conversation with Mr. R. R. Macleod, Assistant Engineer of the Southern Pacific Railroad, Monterey division, he gave a glowing description of the most extensive and valuable saline deposit, in the great Colorado desert, to be found in the United States, if not in the world. In addition to the great deposit or formation of crystallized salt, which is almost pure, there is an inexhaustible submerged lake of clear brine, which is en irely free from iron, sulphur, or any other impurities that sometimes require an expensive process of refining. The company are now erecting vats for the evaporation of the brine, which ranges from 24 to 30 per cent pure salt. No artificial heat will be necessary for evaporation, as the mean of the thermometer at that point in summer is 100 degrees, which is sufficient for all purposes. It is proposed to erect works for calciuating and reducing the finer article for table use in this city. Mr. Macleod says that salt from this great field, or submerged lake, can be delived at the reducing works in Arizona, or this city, for less than one-half the price now paid, and at the same time furnish a superior article. Mr. G. W. Durbrow, who goes down to superintend the work of opening up this mine, goes prepared to make an excellent improvement, which will turn out enormous quantities at a nominal cost.—*Los Angeles Herald.*

The Steamboat Mines.

Cinnabar, Copper and Native Alumnite.

Last Sunday, Judge Henderson, Frank E. Fielding, J. M. Quimbie and others took a trip over to Steamboat Springs, and paid a visit to the party of United States Geologists, now engaged in making a special survey of that strange region. The geologists are making a critical examination of a section of country about four miles square. Although much of great interest is to be found in and about the active springs, some curious deposits of minerals are to be seen in the burned-out ground which extends to a great distance on all sides, particularly to the west and south. In the vicinity of the extinct springs are to be found great deposits of sulphur, copper, cinnabar and other metals and minerals.

The Quicksilver Mine.

The party from this city paid a visit to the quicksilver mine of J. B. Dazet & Co., and brought back with them many beautiful specimens. The cinnabar shown is of excellent quality, and is procured quite near the surface. With proper apparatus this ore can undoubtedly be worked to a profit. It can be mined very cheaply, and the cost of extracting the metal from the ore should not be great, as there is in the vicinity an abundance of fuel.

Even now, at the active springs, cinnabar is to be seen in process of formation, but there the quantity is not so great as to the westward about the extinct springs, where the ore was deposited in cooler ground. The whole tract appears to be filled with ore and minerals, and some of the deposits are undoubtedly of great value. There are large deposits of carbonate of copper in the same place where the quicksilver is found, and near at hand are large beds of sulphur.

Sulphate of Alumina.

On the claim of Dazet & Co., our party made the discovery of a great deposit of native alumnite, or sulphate of alumina mixed with silicate of alumina. In regard to this deposit Mr. F. E. Fielding, the well-known assayer of the Consolidated Virginia office, furnishes the following: Native aluminite, or sulphate of alumina, exists in Washoe county, Nevada, in large deposits, and up to the present time I believe I am the first one who has made a thorough examination and chemical analysis of this now valuable mineral.

Properties and Uses.

Sulphate of alumina, when mixed with sulphate of potassa, yields alum, and this is a salt of extensive use in the arts, especially for the preparation of mordants, employed by the dyer and calico printer.

The Metal Aluminium

Is obtained on decomposing the chloride of aluminum by sodium. At a high temperature intense ignition ensues and the residue—aluminium—forms metallic globules in the midst of the chloride of sodium, which is removed by water.

The metal aluminium is bluish-white, malliable and ductile, of about the hardness of silver. But under the same bulk it has only about one-fifth of the weight of silver. This metal is now largely manufactured in the United States, at Philadelphia. Its lightness is a great recommendation, and it is now much used for ornamental and other purposes, especially for the small scale weights used by assayers and chemists. Being very light in bulk, it offers a much larger surface for manipulation with the piucettes or tweezers.

Samples of this mineral were brought to this city, and in appearance resembles decomposed alabaster. It seems to be very pure. Samples will be sent to State Mineralogist Hanks, of California, and perhaps to some other scientist of that State.—*Virginia Enterprise.*

Clifton's Bullion Output.

The total bullion output of the Clifton district for the month of November, 1884 was, in round figures, 1,140,000 pounds of black copper, divided between the two companies as follows: Arizona Copper Company 640,000 pounds; Detroit Copper Company 500,000 pounds. The average fineness of the first named is 97½ per cent, and of the latter 98 per cent. The Detroit company are running but one furnace at present, a 90-ton Fraser & Chalmers water jacket. As the furnace was "blown in," but 26 days their average output was over 19,000 pounds daily. The Arizona company expect to blow in additional furnaces the latter part of this month, or as soon as the cars are running to their mines on the western slope of Longfellow hill, when their output will be largely increased. At present they are running three furnaces, two 30-tons and one 60-ton of the Fraser & Chalmers make.

The Detroit company has recently completed a system of 7,200 feet of 20 inch gauge railroad by which its mines are now directly connected with the reduction works. The cost per ton for hauling ore is now trifling. In the future, during wet weather there will be no lack of ore, on account of the bad condition of the roads, as the little six-ton locomotive will glide over the iron rails as smoothly in wet seasons as dry.

A pipe line is now being laid from the tanks of the Detroit Copper Company, over to the Longfellow mine. As soon as it is completed the water supply at the mine will be from the San Francisco river instead of from Chase creek which has a copperish taste, and color, and is certainly not healthy. *Clifton Clarion.*

102680

MECHANICAL PROGRESS.

A New Process for Toughening Steel.

The French Societe d'Encouragement have had under prolonged examination a process invented by M. Clemandot for working steel. This process is described by the *Revue Industrielle* as consisting in heating the metal until it acquires a sufficient ductility, and then subjecting it to high pressure during cooling. In this way a modification of the structure of the metal is produced, and the material acquires properties analagous to those developed by tempering. It is admitted that the compression of steel has already been practiced in England by Whitworth, but, it is contended, merely with a view to prevent air holes caused by the development of gaseous bubbles during the solidification of the steel. Similar processes have been tried in France, but only upon the same principle—that is to say, by operating upon the metal while yet in the state of fusion. M. Clemandot, on the contrary, takes steel already made, heats it simply to a chorry red, and submits it, by means of a hydraulic press, to pressures of from 1,000 to 3,000 kilos per square centimeter. After having allowed the steel to cool between the two plates of the press, it is withdrawn with all its new qualities perfectly developed, and does not require any further treatment. The result of the process is to impart to the steel a fineness of grain, a degree of hardness, and a notable accession of strength to withstand rupture. This alteration is most considerable with highly carbonated steel, and in this respect the metal is made to resemble tempered steel, without being in all points identical with it. The cause of the alteration in physical condition is ascribed to the rapid heating, and no less rapid cooling, of the metal. When the red-hot steel is first strongly compressed, the conversion of the mechanical energy into heat serves to raise the temperature of the entire mass, at the same time that the particles of the metal are more closely cemented together. This effect is followed by a rapid cooling, due to the contact of the plates of the hydraulic press with the surfaces of the metal. The close pressure materially increases this conducting effect of the cold metal.

Wire Cutting—A Convenient Tool.

There are jobs in which the treatment of wire in short lengths is requisite, which require that the wire should be cut as even as possibly, that is, that the end cut should be square. In all usual methods the wire is held rigidly and immovable, while a downward or a swinging cutter severs the material. It is rare that a wire or small rod can be so cut without leaving the wire with jammed-in ends or a cross section like a squeezed lemon. It is evident that for many purposes it is desirable that sections of wire should be cut off square. This can be done. It is done by a machine similar to that which severs bars of steel and iron—by a turning tool or its equivalent. But such a machine is costly, and can pay for itself only where much of such work is required.

But a handy tool for squarely severing wire, so as to leave the ends square, can be made in any machine shop, on the principle of a rolling cut. The reason why a wire, or any other rod or bar of iron, is compressed when cut cold, is because the action of the cutters is that of shears—two inclined planes, acting in the same line, horizontal or vertical. If one blade was fixed and the other rotary, there need be no compression of the rod or wire that passed between them; the rotary cutter would simply mark a circumferential line, to which the fixed cutter would respond by deepening it.

A very simple implement may be produced in the shop for this purpose, capable of cutting rods from one-quarter of an inch diameter to any size of wire. A steel blank of T form may be forged, the dependent or lower portion of the T to engage with the jaws of a vise, or be seated in a bench. In the other portion should be drilled a series of holes to fit the sizes of wire to be cut, all the holes on a line—horizontal—and another hole at the end of them to receive a bolt to hold a lever. The lever should be of steel at its acting portion, and both it and the standard be ground, and hardened, and tempered. But the lever should have at its pivot end a curved slot to engage with a fixed pivot in the standard, so that when brought down on the rod or wire it would slide over it, inducing a rolling of the rod or wire, cutting a score entirely around it before being "brought up" by the end of the curved slot against the fixed pivot or stud. The curve of the slot can be easily calculated, so that the cutting off action will suit all diameters within a range of from quarter-inch to No. 6 wire, or even much smaller.

ACCIDENTS IN PUTTING ON BELTS.—A writer in a mechanical paper, discoursing of accidents from running machinery, makes the following pertinent remark as to a preventable class of accidents: "One great fault, and one that causes numerous accidents with many workmen, is the manner in which they attempt to put on belts while pulleys are under motion. More people get caught in belting by attempting to do this than in any other way. I have seen men on a ladder, trying to put on a 10-inch belt, running at high speed, crowding the belt against the pulley, and burning it as well as their hands, and finally having to give it up as a failure; then they had the speed decreased, and the belt put on without any trouble. There is nothing that agitates my nervous system more than to see some one attempt to put on a belt, standing on the wrong side of the pulley. The right place is to stand on the opposite side of the belt, putting it on as it travels toward you. Having a good foundation to stand on, take the belt in hand, and lead on to the pulley, moving the hand as fast as the pulley travels. This is the whole secret. I have seen a little fellow, who understood this principle, go to a large belt that three men were tugging at, and easily put it on the pulley at first trial."

Does Vibration Affect the Balance of Machines?

"A machine is said to be in balance," says the *Mechanical News*, "when it moves harmoniously and without visible vibration, but this occurs only at certain speeds. That is to say, a machine balanced for one velocity will be out of balance at others. The causes of this are obscure, aside from centrifugal disturbance, and many good observers confess their inability to discover it.

"The relative velocities of moving parts of a machine remain the same at all speeds, but the relative vibrations do not. At certain velocities the connecting rod of a steam engine transmits the power without vibration or jar, but urged faster it trembles visibly.

"These vibrations do not occur in equal times, but are greater or less according as the rod is approaching or leaving the center, and when it is pushing the load or pulling it. Circumstances also affect the vibration. This want of synchronism affects the balance, in that it transfers the jar of the vibration to the moving parts in unequal times. Vibration is not a force, but is an action caused by it, and is undoubtedly a disturbance to harmonious motion.

"Again, it is an oft-stated point that a reciprocating mass cannot be balanced by a rotating mass. If this is true, what becomes of the notorious fact that engines of all kinds move in equal times, as far as we can see? They do not show any want of balance, though cast loose from fastenings and held down only by their weight. An engine out of balance should give evidence of it by horizontal motion (supposing it to be a horizontal engine) of the bed-plate on its supports. Engines, when run at certain velocities under such circumstances, sway the bed-plates to and fro, but at higher speeds remain stationary. What has counteracted this tendency when they remain motionless? Has not vibration entered into the question, and by its infinitesimal swaying of masses—like the beats of a pendulum—acted as a balance?

"Our argument is for and against; we do not know what causes the disturbances and erratic action mentioned, but it would seem that the vibration of masses of metal at certain velocities may affect the balance of machines in a marked degree. We do not allude to mere tremor, but to visible movement. Even the former may have its influence when large masses are disturbed."

The vibration or visible movements of a machine have nothing to do with the balancing of the running parts. On a rotating mass the connecting rod is just as much out of balance, proportionately, at one speed as at another, only its time of action differs materially with the synchronous movements of the bed-plate on its supports. At a given speed the inertia of the reciprocating parts acts in harmony with the vibrating wear of the engine and helps at every movement. At a greater or slower speed many of these effects of inertia are applied to check these visible movements, as they take place at an instant when they are of no use to keep the bed in motion on its foundation. A reciprocating mass cannot very well be balanced by a rotating body, but can be equalized at least in one direction, and where the movements are to be guarded against, horizontally, the unequal effect should be left vertical and bring the hammer blow on the supports similar to that of the wheels of a locomotive on the rails, then there will not be felt any of that shake to the building when the machinery is in one of the upper stories.

A NEW METHOD OF PRODUCING PAPER PULP.—A more economical method of producing paper pulp is claimed to be realized in the use of a new and ingenious machine, by which the wood is shaved off so finely that it is ready to go at once into the boiler. The machine takes a log twelve inches in length, which it revolves at a speed of one thousand revolutions per minute, and a sharp cutter shaves off a shaving so thin that it would take 750 of them to make an inch, a nicety of execution which may be judged of by the fact that two hundred sheets of ordinary paper are required to make an inch. The knife has a sliding motion, and gradually moves forward as the block decreases in diameter, and in order that it shall not become dull and the filer consequently be of uneven thickness, there is an ingenious arrangement of whetstones constantly at work on the knife.

SCIENTIFIC PROGRESS.

The Direction of the Wind.

That the changing of the direction of the wind is due to the shifting of the situations of greatest heat on the earth is substantially proved by the fact that in certain regions of the terrestrial surface, where the situations of the greatest heat and cold do not alter the direction in which they lie to each other, the wind does not change, but always blows in the same direction from one day to another, and all the year round. This occurs in the great open spaces of the ocean, where there is no land to get heated up by the sunshine of the day, and to get cool by the scattering of the heat at night. In those spaces, for a vast breadth of many hundreds of miles, the sun shines down day after day upon the surface of the sea, heating the water most along the mid-ocean track which lies most immediately beneath its burning rays as it passes along from east to west. This midway track of the strongest sunshine crosses the wide ocean as a belt or zone that spreads some way to either side of the equator. Throughout this midway track the cooler and heavier air on either hand drifts in from the north and from the south, and then rises up, as it becomes heated by the sun, where the two currents meet.

In both instances, however, in consequence of the spinning round of the earth, the advancing wind acquires a westward as well as equatorial drift. The air current, as it approached the midway equatorial zone, where the onward movement of the sea covered surface of the earth is performed with the vast velocity of 1,000 miles an hour, does not immediately acquire this full rate of speed, and lags back upon the ocean, so that it appears as a drift toward the west as well as toward the equator. On the north side of the equator the wind blows all the year round from the northeast, and on the south from the southeast, both in the Atlantic and Pacific Oceans. These steady and unchanging ocean winds are called the trade winds, on account of the great service they render to ships carrying merchandise across these portions of the sea. In sailing from England to the Cape of Good Hope, through the entire length of the Atlantic Ocean, ships, before they reach the equator, have to pass over a broad space where strong winds are always blowing steadily from the northeast. That is the region of the northeast trades. They then traverse a space near to the equator itself, where the northeast winds cease to blow, and where the air is very still and calm, and they afterward come to a region to the south of the equator, where strong winds are continually blowing from the southeast. That is the region of the southeast trades.—*Science for All.*

Purification of Water by Motion.

A discovery has been made by Dr. Pehl, of St. Petersburg, which promises to have a very important hearing on many industrial processes. The water of the river Neva is very free from bacteria, having only about 300 germs in a cubic centimeter. The canals of St. Petersburg, on the contrary, are infected with bacteria, their number reaching 110,000 in a cubic centimeter, even during good weather. The same is true with regard to the conduits of water for the supply of the city. While the chemical composition of the water passing through these city conduits hardly differs from that of the Neva (by which they are supplied), the number of bacteria reaches 70,000 against 300 in the water freely taken from the river; and the worst water was found in the chief conduit, although all details of its construction are the same as in the secondary conduits. Dr. Pehl explains this anomaly by the rapidity of the motion of the motion of the water, and he has made direct experiments in order to ascertain that. In fact, when water was brought into rapid motion for an hour, by means of a centrifugal machine, the number of developing germs was reduced by ninety per cent. Further experiments will show if this destruction of germs is due to the motion of the mass of water, or to molecular motion. If this discovery of Dr. Pehl's be confirmed, it will become possible to destroy bacteria, and render a water comparatively pure, simply by passing it through a centrifugal machine. The subject is of special interest to brewers, who suffer, perhaps, more than any other manufacturers from the attacks of bacteria.

Uses of Arctic Explorations.

In 300 years there have been some 200 Arctic voyages for various purposes and with various fates. The Greely expedition was but one of thirteen expeditions. Five hundred men passed two winters within the polar circle, and nineteen of them only were lost. And Lieutenant Ray says that the result of all these expeditions will be the doubling of the world's knowledge of the magnetic forces. That is to say, as the Rev. Brooke Herford states in his admirable sermon upon the subject: "Not one of all the thousand and ten thousand craft sailing to and fro among the lands of earth but will be a little surer of its compass, a little closer in its reckoning, a little safer than it ever was before."

Is this worth nothing? Is not the risk, the loss even, amply recompensed? But also, as Mr. Herford points out, the moral qualities, the patience, the courage, the self-denial; the faith, the endurance developed by these northern researches are incomparable. "There is no other chapter in the history of human doings to be compared with it. Beside it the adventures of commerce and conquest look greedy and base, the stories of chivalry are mere tinsel, the long heroism of the crusades seems a fevered frenzy. *Cui bono?* is not an argument to discourage the reckless soul, which the prospect of peril inspires, nor will the pathetic story of patient and generous endurance, amid apparently remediless suffering, which the record of the Greely expedition discloses, dismay or deter other Greelys from daring the same dangers."

A NEW HYDROCARBON MINERAL.—A new mineral hydrocarbon has recently been discovered near Seefeld, in the Tyrol. It occurs crudely in the form of a bituminous rock, of peculiar constitution; and the bitumen is believed to be composed of the decomposed remains of prehistoric marine animals. Treated with strong sulphuric acid, the bitumen yields a soft substance, which when neutralized is not unlike vaseline in consistence, but resembles coal tar in color. It differs from all known vegetable and mineral tars, however, by its odor, and by the possession of peculiar physical properties. It forms an emulsion with water; and is partly soluble in alcohol and ether. A mixture of these two liquids completely dissolves it. It is miscible in all proportions with vaseline and oils. The name "ichtyol" has been given to the substance, which is characterized above all by its richness in sulphur, of which it contains about 10 per cent. This element is so intimately mixed with the ichtyol that it can only be separated by the complete decomposition of the latter. Besides sulphur, ichtyol contains oxygen, carbon, hydrogen and traces of phosphorus. In consequence of the high proportion of sulphur, the new hydrocarbon is regarded hopefully as a medicament or unguent.

THE EFFECTS OF LIGHTNING STROKES ON HUMAN BEINGS.—A paper was read by Harr Heusner at a recent congress of German medical men, held at Magdeburg, on the effects of lightning stroke on human beings, and the author showed that when the lightning discharge passed through the skin, its passage was much easier, that is, the internal organs are much more conducive than the epidermis. If this was known, it was not so well known that the brain and spinal cord are apparently conductors, and that a lightning stroke on the head, does not materially injure the brain beyond shattering the nerves and causing temporary derangement. Most persons struck by lightning, do not remember anything about the stroke; but others describe a sensation such as would be caused by their being struck by a heavy blow, and some have likened the shock to what they would be supposed to feel if torn into small pieces. Engineering says the subject is now happily beginning to engage the attention of physiologists as well as physicists.

PREPARATION OF MAGNESIUM.—A process patented by Gratzel, for the separation of alkaline metals by electrolysis, has been very successful in the reduction of magnesium. In Berlin there has recently been exhibited, as a product of this process a ball of pure magnesium, of about five inches diameter. It was exceedingly brilliant, closely resembling silver; and had lost nothing of its luster since its separation. This preservation from corrosion is a sign of the high degree of purity of the metal, and forms a striking contrast to the magnesium hitherto obtained, which was always more or less alloyed with potassium, and consequently easily oxidized, especially in a damp atmosphere. The purer magnesium is considered to be destined to increasing maritime use, because the rays of the magnesium light appear to have a greater penetrative power in fogs and mists than the electric arc.

THE CHEAPEST ANTISEPTIC.—M. Pasteur anticipates that bisulphide of carbon will become the most efficacious of all antiseptics, as it is also the cheapest, costing but a fraction of a penny per pound in large quantity. It is also the best insecticide known, and for this purpose may, perhaps, be useful to preserve wood-work in tropical countries. Some idea of the use it is already put to may be gathered from the fact, that over eight million pounds of the substance are used annually to check the ravages of phylloxera. Carbon bisulphide, as produced, is about as foul smelling a compound as is possible to find; but it is capable of purification till all offensive odor is removed, and it is sufficiently pure in smell almost to mix with a perfume.

IDUNIUM.—"Idunium" is the name proposed by Professor Wehsky for the metal just discovered by him as one of the components of native vanadate of lead. The mineral is rather a scarce one, of a yellow color, and contains several other metals, of which zinc, iron and arsenic are among the most prominent. Idunium resembles vanedine in several respects, both physically and chemically, while the only oxide hitherto examined, forms stable salts with alkaline bases, and thus would appear to possess distinctly acid properties.

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Southern California—L. M. Holt, Riverside, Cal.
☞ See Advertising Columns.

Passing Events.

The weather all over the State has been exceedingly cold for the past few days, and much snow has fallen. The effect has been to retard operations in many places.

The State Legislature will convene at Sacramento on Monday next.

There is considerable talk over recent gold discoveries in Lower California of late, but the country is so dry that it is difficult to do much unless the ground is very rich. A five-stamp mill was sent down from this city to some new mines in Lower California last week. Water is to be brought in a flume to work the mill.

The MINING AND SCIENTIFIC PRESS commences a new volume with this number. We expect to have a large number of illustrations of mining and metallurgical appliances in this volume, all of which will be of interest to miners and millmen.

COPPER was never so cheap as now. The present price is about 12½ cents a pound. The old price, a few years ago, was 18 to 20 cents, and during the war it went up to 50 cents. Curiously enough, as the price of copper has gone down, the uses for it have increased, and hundreds of things are now made of cheaper metals, or not made at all.

Smelting in Adobe Furnaces and Refining in Mexican Vaso.

[Written for PRESS by A. GMEHLING, of Parral, Mexico.]

Smelting.

A person familiar with and reading of newly constructed smelting works, with their improved machinery and better mode of working, may find these few remarks and facts about the reduction of ores, as carried on in many places in Mexico, worthy of some attention, they being descriptive of a method, so exceedingly simple, crude and imperfect, as can possibly be imagined.

The place I have reference to has three adobe blast furnaces, and one cupellation hearth in operation. The blast furnaces are very simple in construction, and built out of adobes. They have one tuyere each, which is fitted into a copper box, which is to substitute the water jacket. It is open against the outside and cooled by the air, the copper, however, occasionally melting off. The box is 32 inches high, 24 inches broad, 6 inches in depth, and 1 inch thick. The center has a 3-inch wide round opening to take up the tuyere. This copper box forms the lower back of the furnace. The profile of the shaft is square, 2½ by 1½ feet, and the furnace is, from the lead tap to the top, 8 feet high. The tops of furnaces are open and the fumes are discharged through it into the hoods, which shelter the furnaces. A stair leads to the open top. The necessary blast is supplied by a No. 7 Sturtevaut blower, the motive power being an eight horse-power turbine. The wind pressure amounts to 2" water, although 4" would be required.

Different kind of ores are delivered at the works. They are mostly carbonates, nearly self fluxing and easy to smelt and contain some arsenic and antimony. They average between 20—30 per cent of lead, 25—35 ounces of silver, .25 ounces of gold per ton of 2,000 pounds. Each charge was made up of (that is, during my presence) 900 pounds of ores, (assaying 30 ounces of silver, .25 ounces of gold, 23 per cent of lead) 225 pounds of litharge, skims, cupelling hearth (assaying 60 per cent of lead, 5 ounces of silver) 200 pounds of old Mexican slag, (assaying 8 per cent of lead, 5 ounces of silver).

The fuel is exclusively charcoal (oak) and costs $8 per ton. One hundred pounds of charcoal will smelt 350 pounds of charge. Each furnace requires three men per shift of 12 hours, namely: one smelter, one feeder and one slag man. Each furnace works 5 of these charges in 24 hours, or 6,625 pounds. The bullion is tapped off as soon as one charge went through the furnace, and each tap delivers on an average 225 pounds of lead-silver bullion. The bullion flows into the sand on the floor and is covered with fine dust and taken out in one cake after cooling.

During 10 days 3 of these furnaces smelted 150 charges and produced 32,850 pounds of cake bullion. After resmelting in the cupellation hearth, 3,400 pounds of dross and 3,250 pounds of scum were drawn and 28,200 pounds of clean bullion obtained, which assayed 101 ounces of silver and 1 ounce of gold to the ton, the dross consisting principally of oxides, mixed with dust, slag and metallic lead, assaying 35.30 per cent of lead, 12 ounces of silver per ton; while the scum is chiefly composed of the oxides of lead, antimony, arsenic, etc., mixed with dust and slag and showing the same assay. According to given assays 150 charges contain:

	Lbs. of Lead.	Ozs. of Silver.	Ozs. of Gold.
	53,700	2,184	16.80
Bullion, dross and scum yield:			
Bullion.....	28,059	1,424.10	14.10
Dross.....	1,200	20.40	.....
Scum.....	1,150	19.50	.....
Total.....	30,409	1,464.00	14.10
Yield of ores and fluxes..	53,700	2,184	16.80
Returns.....	30,409	1,464	14.10
Loss.....	23,291	720	2.70
Loss in percentage.....	43 37	32.96	16.07

The slag obtained is clean from metallic lead and thrown over the dump. It assays from 4 to 5 per cent of lead, 2—3 ounces silver per ton. There is with every tap a small amount of arsenical speiss drawn, which comes immediately back to the blast furnace.

During the whole process of working 150 charges, the amount of slag received figures approximately at 60 tons. The average assay of same will be 4.5 per cent of lead and 2.50 ounces of silver to the ton. According to this data we find that 5,400 pounds of lead and 150 ounces of silver were carried off by the slag, while 17,891 pounds of lead and 570 ounces of silver went off with fumes and smoke into the atmosphere. Or, expressed in figures, we must acknowledge that 43 37 per cent of lead, 32.96 per cent of silver, 16.07 per cent of gold were lost during the entire smelting operation and from these losses in lead and silver:

	Lead.	Silver.
Were lost in the slag.....	23.18	20.83
Went off with the fumes.....	76.82	79.17
Total.....	100.00	100.00

Refining or Cupelling.

The refining of the lead-silver bullion is carried on with very primitive appliances. A more imperfect and cheaper cupelling hearth can hardly be imagined, although the losses of silver and lead are, comparatively speaking, not very heavy. Inside of 24 hours the hearth is built up under contract, costing $3. The foundation is about 18" thick and the hearth tamped upon it out of a mixture of three parts of wood-ashes and one part of clay. Six by four feet are the dimensions of the hearth, and the fire-place is 18" wide and 6 feet long. After charging the furnace with about 20,000 pounds of bullion the hearth is arched in an extremely simple way, by laying adobes loosely upon each other and patching up the cracks with clay. The furnace has no connection with any chimney or flue-chamber, and fumes and smoke are discharged in the same manner as by the blast furnaces. As soon as the lead charged is melted the balance of same is added. Commonly, 26 hours will pass before the dross and scum are drawn, and from now four days more are required before the silver is fine, the fineness reaching mostly 950. The cupelling hearth is heated by the branches of the semma plant, and cost $6.25 per 24 hours. Two men per shift can do the work with ease. The silver cools in the furnace and is taken out in one piece.

The cupelling of the 28,200 pounds of lead-silver bullion was done with the following results: Received 1430 ounces of silver-gold bullion, 950 fine; 12 175-2000 tons of litharge, assaying 90 of lead, 2 ounces silver per ton; 2 375-2000 tons of lead hearth, assaying 60 of lead, 12 ounces of silver per ton. The 1430 ounces of silver-gold bullion contain:

	Ounces.
Gold and silver.....	1,358.5
Gold (exclusive loss).....	14.1
Silver, ozs.....	1,344.40
Silver in bullion.....	1,344.40
Silver in litharge.....	24 30
Silver in lead hearth.....	28.50
Total.....	1,397.20
	Pounds.
Lead in litharge.....	21,915
Lead in hearth.....	2,850
Total.....	24,765
	Ounces.
Silver in lead bullion.....	1,424.10
Silver received.....	1,397.2
Loss in ounces.....	26.90
Loss in percentage of silver, 1.88	
	Pounds.
Lead in bullion.....	28,059
Lead received.....	24,765
Loss in lbs.....	3,294
Loss in percentage of lead, 11.73	

Russian Mines.

We had an interview this week with Mr. Michael Schostak, a Russian mining engineer, who is making a tour of the gold mining regions of the world in the interest of his Government, with the view of obtaining improved appliances for working Russian gold fields. He has spent several months in Australia, and will remain in California some months, visiting our mines. He is more particularly desirous of inquiring as to our system of working gravel deposits, both by drift and hydraulic process. It is his intention to take back to Russia complete outfits of the appliances in use in these mines, and these things will be purchased in San Francisco. He will also examine our system of quartz mining and the machinery connected therewith.

Mr. Schostak gave us an idea of the method of working gold mines in Russia. Among other things, he says they are not allowed to lose in washing gravel more than a certain percentage. The mines belong to the Government, and those persons who lose more than 5 per cent are, after the first year, compelled to pay a fine of 500 rubles; if it occurs a second time, the fine is doubled; and for a third offense they are prohibited from mining. Government inspectors periodically visit the mines and make the necessary test of tailings, etc. Such a system grafted on to our mining customs would be rather hard on some of our superintendents and companies.

Mr. Schostak has been for some seven years past in the Nertschinsk mining district, in Eastern Siberia, some 4,000 miles from St. Petersburg. These are private placer mines, belonging to the Emperor. They are not very rich, not averaging more than two to four drachms a ton. The mines throughout Siberia are generally worked by free miners. There are about 20 or 25 different mines in this district, in only one of which are convicts employed, about 4,000 of them being worked in the Kara placer mine. Miners are not paid by the day, as in this country, but by the cubic yard, at the rate of 20 cents a yard. They usually make about 60 cents a day. Their work consists merely in carting the sand to the puddling machines, which are similar to those used in other placer mining countries, but in some respects better. They are of large capacity. The convicts are paid the same wages as the others, their money being paid into the treasury of the Minister of the Interior. They are usually men who are serving sentences from two to twenty years, and at the expiration of that time they are paid 15 per cent of all they have earned during their imprisonment. After they become free they are still compelled to remain in Siberia, and receive this compensation to assist them in beginning their new life outside the prison walls, being granted in addition a portion of land, usually amounting to four or five acres. The Minister gets the same pro rata of wages as is paid for free labor, but the convicts never earn as much as the others, from the fact that they lack the interest which urges the free man, the latter generally earning five times as much.

Within a few days news has been received, and confirmed by the Russian Consul in this city, that the Emperor has decided to commence the building of a system of railroads throughout Siberia. This will bring the mines into direct and closer communication with the large cities and more settled communities, and will result no doubt in bringing in more capital and a great many people. The great drawback has always been the insufficiency of labor. At present it consists of the mere handful of peasants and convicts, the former being mostly descendants of exiled prisoners. There are no foundries, and the expense of bringing machinery across the mountains is so enormous as not to be thought of. There are plenty of gold mines which have not yet been tried or tested. With improved California processes, instead of the slower ones now in vogue, many of these fields would be made to pay.

Mr. Schostak intends recommending to his Government to buy the machinery in San Francisco. California possesses facilities for shipping unequaled by any other place where machinery is extensively built. It can be sent all the way by water direct to Nertschinsk. At Yokohama a change of steamers will probably be made, and thence to Nikolaevski, at the mouth of the Amoor river. This river is always navigable from April to October, and the distance of 2,000 miles on the river to Nertschinsk can be accomplished in three weeks. This place is the most important district in the country. Already several new mining places have sprung up along the river, and the importation of machinery will give the mining industry a strong and refreshing impetus.

The mines are so far removed from the Russian capital and the other commercial and money-eyed centers, and the mode of travel so rough and limited, that few care to risk investment at such a distance. The companies usually consist of six or eight men, and there is no issuing of shares of stock as in this country. They are usually men who began mining work on a small scale, and who have gradually grown wealthy. Only free labor is employed, and, as a rule, private enterprises do not care to furnish convicts with work at the expense of the free men. In staking claims, locators are allowed to take up ground three miles in length, and the width of the valley, the distance between the mountains varying from one-half to two miles. Where discoveries are made, each name is entitled to take up such an extent of surface. This refers entirely to placer mining. So little has been done in the discovery of lodes that nothing looking to regulating such locations has been deemed necessary. The restrictions placed upon foreigners are limited.

The Separation of Strata in Folding.

At a recent meeting of the American Institute of Mining Engineers, the following paper by Fred G. Bulkley of Leadville, Colorado, was read:

That portion of the geological structure of the Leadville district which rests upon the Archæan is made up of sedimentary beds of Siluriau and Carboniferous formation, consisting of many conformable strata of limestones, quartzites, and shales, which have a total present thickness of about five thousand feet. Interbedded with these strata are found, under somewhat fixed laws of regularity, sheets of intrusive igneous rock, varying in thickness from a foot or two to several hundred feet. These consist for the most part of various types of felsite rocks, classed, by the sanction of common and long-continued usage, under the general term of porphyries.

The region here under discussion is made up of a series of great geological folds, the result of dynamic force applied "tangentially to the surface of the earth and in a direction at right angles with the axes of folding," as explained by the generally accepted theory of contraction advanced by Descartes, De la Beche and others, and discussed by more recent writers on geology.

In a study of this feature of the formation, together with the fact that the intrusive igneous sheets are found interbedded with the pre-existent stratified rocks, may be found the material for a theory which will perhaps explain the conditions under which the fused stream of porphyry might have found its place, without discussing the possibility of an upward pressure in the mass itself, sufficiently great to pry open or lift the weight of the superincumbent beds. A formulation of this theory is:

The result of the application of tangential pressure upon rock-beds will be not only a folding or plication of the beds, but also a tendency to separation in places of the strata composing them.

This may be nicely illustrated by the experiment of pressing together longitudinally one hundred pages of any volume, or as many sheets of paper laid flatly one upon another. In geological folding the principal remains the same, and its application is attended by a like result. In the latter case, however, gravity becomes an important factor.

In Fig. 1 an ideal anticlinal fold is represented, produced by the horizontal pressure, P P, which force is exerted longitudinally throughout the anticlinal, and its direction is everywhere tangent to the curve of the fold. Thus the resultant P′ P″ of this force, as applied at O and O′, shows an uplift equally applied to all the strata, which is consequently exerted with increasing effect upon the uppermost sheets, thus causing a tendency to separation of the strata. The force of gravity is represented by G O, G O″; and it is evident that at the summit and at the foot of the anticlinal, as at O O, this whole force is exerted in a direction at right angles with the bedding-planes of the structure, its whole effect being exerted to prevent a separation of the strata, while at other points, at midway between the foot and summit, at O″, the force thus exerted is much less. A mathematical analysis of the force of gravity at this point shows that the force exerted at right angles to the planes of stratification is directly proportional to the cosine of the angle of dip, and is represented by G′ O″. This, of course, remains true for all points between the foot and summit of the fold. Thus the weight of a thickness of 10,000 feet of sedimentary rock may be estimated at about 875 tons per square foot, which pressure will be exerted at the summit and foot of the anticlinal to prevent a separation of the strata, while if the angle of dip at O″ be 60°, the force thus exerted at that point will he but 437.5 tons, so that at the point or line of greatest dip will be the greatest separation of the strata. As a result there will be created fissures or cavities, widest at the point of greatest dip, and thinning gradually towards the foot and summit, whose extent, vertically and laterally, will depend upon the extent of the folding and upon the thickness of the superposed beds. That the eruption of porphyry at Leadville occurred contemporaneously with and incidental upon the folding is altogether possible (such a theory being borne out by the absence of intrusive sheets in untilted strata); and in the presence of such pre-existent fissures it would naturally fill the latter with its fused mass, and probably, to a great extent, enlarge them, as any upward pressure in the mass itself would most avail where the pressure of gravity is least. This theory gains strength from some corroborative facts revealed by an examination of certain beds of limestone in this region which have been greatly involved in the general folding. In one locality a dyke of gray porphyry, having a thickness of about ten feet, cuts up nearly vertically through the lime-strata into an overlying sheet of older white porphyry. Near the point where the dyke passes up through the plane of contact of the two rocks, a fault of about ten feet in the lime strata is observed, which extends neither up into the porphyry nor for any considerable depth into the limestone below, where occur several bedded sheets of gray porphyry, from one to five feet thick, and of considerable lateral extent, injected from and forming a part of the mass of the dyke, as shown in Fig. 2. In this, *P* is white porphyry, *d* the dyke, *l* limestone, and *m* fault.

That the intrusion of the dyke material could have occurred under a sufficient pressure in the mass itself to render possible the creation of the crevices containing these thin lateral sheets, is rendered altogether improbable from a consideration of the small size of the dyke; and that the slight local fault existed before its intrusion is proven by the fact that the flow of the older white porphyry conforms precisely with the faulted surface. These crevices must, then, have existed previous to the dyke, and were naturally filled at the time of its injection. In another locality, on the slope of an anticlinal, successive crevices in limestone exist, from one to six feet thick, lying parallel with the bedding-planes, and filled with ochreous clay and limonite, carried in by and deposited from percolating waters. Here no connection exists with the vent or place of eruption of any igneous rock.

There exists but little room for doubt that the origin of the enclosing crevice of many metalliferous *bed-veins*, properly so called (in contradistinction from those *ore beds* contemporaneous in their epoch with and forming an integral part of the enclosing rocks), may be referred to a separation of the strata in anticlinal folding.

The Spar lode, of Pitkin county, Colorado, is a bed-vein occurring at the plane of contact between a bed of calcite above and a bed of dolomite below. Here, also, the formation consists of conformable sedimentary beds of the lower Silurian, lower, middle and upper Carboniferous, and Cretaceous epochs, with interbedded, intrusive, igneous sheets; and the vein in question is situated upon the westerly slope of a great anticlinal. It varies in thickness from 4 to 12 feet, and evidence that it forms the filling of a pre-existent crevice is found in the conditions illustrated by Fig. 3, viz., that, where they are not disintegrated, the uppermost strata of the dolomite are found contorted and folded in short, deep flexures, in local unconformity (*d′*), which could only have occurred within the space of a pre-existent fissure or crevice. In this figure, *c* is calcite, *d d′* dolomite, *v* vein material foreign to the walls. The Monarch vein, of Chaffee county and the Combined Discovery vein, of Eagle county, Colorado, present examples of similarly-formed crevices, enclosing bed-veins, on the slopes of anticlinal folds. In each of these cases, parts of the crevice remain entirely empty of vein-material or other matter, while, in the latter instance, a band of aragonite, now about eight inches thick, is still in process of formation upon the hanging wall.

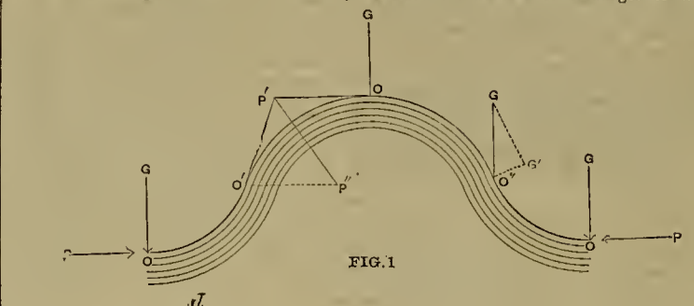

FIG. 1

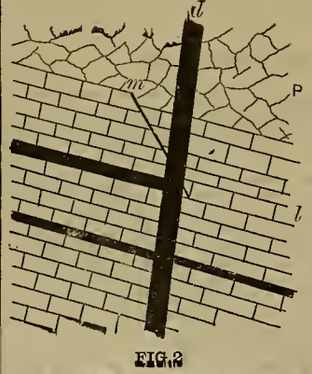

FIG. 2

FIG. 3

FIGURES ILLUSTRATIVE OF SEPARATION OF STRATA IN FOLDING.

Round or Flat Hoisting Rope.

When the character of the rope to be used in hoisting works or mines is being considered it is well to have wide experience to judge from. Many persons still adhere to the idea that hemp is the best material for the purpose, although the steel wire rope has entirely displaced it in this country. Where heavy cages made to carry large loads and many persons are used only the very best quality of rope should be used. It is said that in Belgium, where the number of breakages of hoisting ropes attended with fatal consequences is about twelve a year in one province alone, in France, where there is twice the production, not a single accident has occurred from this cause in three years. Mr. Geo. J. Andre, the author of Continental Colliery Notes, attributes this partly to the excellence of the French ropes and the greater care with which they are used.

These two facts are sufficient to the account for much of the difference; but there is probably something in it due to the form of the rope. A few years ago the flat rope was in high favor in Europe. Papers were read and essays written to prove that in the flat form the component fibers of the rope are more equally strained than in the round form; and consequently that the former gave a longer duration and greater security. The acceptance of these views led to the adoption of the flat form generally in some districts, and in numerous instances in others. Experience seems, however, to have revealed error in these views, for we now find the flat form altogether in disfavor generally in England, though in some localities it is still in common use. But even in these cases it is being gradually abandoned. Whatever be the relative merits of the two forms, it is a remarkable fact that in Belgium, where breakages are numerous, flat ropes are used, while in France, where such accidents are extremely rare, the round form is universally adopted. The absence of accidents from the breaking of drawing ropes at the French mines is, moreover, a sufficient answer to those who maintain that steel ropes afford less security than hemp or aloe fibre.

ANTIMONY is selling in Liverpool at £40 to £42 per ton.

Miners' Lamps.

Some extended experiments have recently been made with miners' safety lamps at the Adderly Green collieries by English Government mine inspectors. The experiments were not made with a view to ascertain the highest velocity which lamps would withstand without passing the flame. Their purpose was to subject the lamps to such conditions as were more frequently met with in the mines than in the testing boxes, and about which there appeared to be but little information. The lamps which were tried were the following: Davy, Clanny, Belgian Mueseler, Marsaut, and (in part) Ashworth, Ford and Williamson. Experiments with the Davy showed that in almost quiescent gas it was possible for a gauze to become red-hot, and to remain so for nearly two hours without passing the gas flame to the outside. The experiments verified the assertions which had been made as to workmen formerly working with red-hot Davy lamps. It was found that with a velocity of 5½ ft. and more per second the Davy continually passed the flame after a few seconds, but that it withstood a velocity of less than 5 ft. per second in which the Clanny passed the flame.—Clanny: Like the Davy it was possible to keep the gauze red-hot for a lengthened time in almost quiescent gas without the flame being passed. It passed the flame at a lower velocity than the Davy, viz., 4.8 ft. per second.—Belgian Mueseler: That lamp was tried complete, and without the outer gauze, and in no single case was an explosion produced, or did the gas flame pass into the top gauze. In some of the experiments the gas flame continued to burn for some time after the lamp had been extinguished, and in certain trials, where the top gauze was removed, relighted the lamp flame. The gas flame invariably rotated round the tube below the horizontal gauze, at times at a very high velocity.—Marsaut: This was tried complete, and with its casting removed, but the flame was not passed. In experiment 5 the almost quiescent gas burnt within the inner gauze for a period of 99 hours and 25 minutes "as a will-o'-the-wisp," without any perceptible effect on the lamp. In velocities of 8 feet per second, when the casing was removed, both gauzes became red-hot; but the gas supply failing, a continuance of the experiments was impossible.—Ford: That lamp invariably became extinguished by its own production of soot.—Ashworth and Williamson: Those were also extinguished after a certain time, probably from an insufficient supply of oxygen. In several of the experiments glasses were cracked without any detrimental effect. Even where the cracks extended to all parts of the glass, the pieces were kept in their places by the top and bottom rings, and in no case allowed the flame to pass. This shows the necessity of well-fitting top and bottom rings. Glasses were cracked in a few experiments by the lamp being tilted at an angle of 45 degrees. In the Marsaut and Clanny, with an ordinary flame, the glass cracked after 30 secs. and 1 min. 55 secs. respectively, while the Mueseler was immediately extinguished. These experiments proved the danger from the Davy and Clanny in ordinary velocities, and tended to remove the idea that a fractured glass was invariably unsafe. In the course of a discussion which took place it was stated that the experiments tended to show that the Mueseler, with the tin case of the Marsaut lamp, was the safest.

THE Southern Utah *Times* warns miners in search of work to steer clear of Frisco. It says: "While the Horn Silver mine is the largest silver-lead producer of which there is any record, there are now in Frisco more than enough to work it. There are idle men here now, good miners, to whom the term tramp cannot be applied. Our climate is mild, and many miners from Northern Utah naturally drift south at this season for work. We have too many here now, and again warn miners to go slow."

OBSIDIAN is found in Inyo county. Some varieties of obsidian cut beautifully, and might be used for ornamental purposes, for paper weights, vases, bases of clocks, and similar purposes.

AT Calico, San Bernardino county, the town has now a population of over 700, and of this number there are some 350 miners at work. Some of the ore being extracted is very rich.

Noted Mining Localities.

When the Comstock lode in Nevada, a few years ago, was turning out her millions annually, every owner of a promising lode claim in Colorado would enthusiastically point out any real or fancied resemblance to the great Nevada producer. Since the Comstock has passed under a cloud and its production has been curtailed to insignificant proportions, no Colorado miner ventures to trace any points of similarity to that greatest of known mineral veins. The stockholders in the different claims on the great Comstock vein have been pluckily endeavoring to unearth another bonanza, and have been doing paid out in assessments instead of having in so years over $30,000,000. When began turning out their the past six croakers prophesied that Leadville mines be played out, be millions annually the only above that ere this they too would by the exhaustion of the ore deposits existing some line, must be quickly exhausted by the extensive exploitation given them. In instances this has been true, but it has never been found that these ore bodies were not confined to the narrow areas popularly ascribed to them, and that the lime floor was not the bedrock limit of their continuance. In the lime and below the lime mineral has been found, and the vacant spaces between great ore chutes have been exploited and other deposits encountered. No well-posted miner of that region now ventures to place a period to the capacities of that district in regard to yield of ore. The future of Leadville to-day is as full of promise as though hundreds of thousands of tons of ore and millions of dollars had not been wrested from those famous old hills. In Nevada and at Leadville miners are gleaning old workings and marketing thousands of tons of ore annually which a few years ago were not marketable. Improvements in milling and smelting methods, economy in management and the willingness to work for smaller profits can be noticed in both these famous sections. The enormous expense attending the exploration of the depths of the Comstock vein will at no distant day cause the total abandonment of the deepest workings unless a bonanza is soon encountered. Exploration at Leadville is not so costly, and hence her hills will be more thoroughly prospected, and as the area is so vast there is every reason to believe that this generation will witness no abandonment of any considerable portion of her territory. Low prices for silver and lead are the only methods of greatly curtailing Leadville's ore product.—*Denver Tribune-Republican.*

Mountain Gold.

A hasty glance at the showing which our banks make in the handling of gold and silver, says the Helena *Independent*, will convince the most incredulous that our surrounding mines are doing a splendid business. The thousands of dollars worth of gold and silver which flows through our banks makes so little noise and stir in the ordinary avenues of life that few have any idea of its extent. A common dray, delivery or beer wagon makes more noise and attracts more attention than the receipt and shipment of $100,000 worth of gold. The different effect of the two on the financial status of our city is too evident to all to need any extended comment. Unless one goes and inquires at the banks, he would hardly dream that 71 lots of gold dust, in all 1,130 ounces, amounting to $18,645, have been received at the First National Bank of Helena since November 19th. Yet this is the case, and this is a small part of their business in this line. Most of this was received from the Cœur d'Aiene country. Since November 5th they have received from the Boston & Montana, $38,990; from the Elkhorn, $12,800 in gold. Within the last month the Helena Mining & Reduction Company has shipped over 5,100 bars, or over 650,000 pounds of base bullion. The expenses of this company, including dividends paid, are over $100,000 per month. That the company is doing a splendid business is shown by the payment of two dividends in a little more than one month. It takes no great stretch of the imagination to understand that the receipts of the company are very large, and doing a handsome business.

The Merchants' National Bank received last evening from the Drum Lummon eight bars of bullion worth about $18,000. We are informed that shipments of this kind are made about twice a week from the Drum Lummon. It is easy to compute the enormous amount which would be received at this rate in the course of a year. This is from one mine alone. Large quantities are received from other smaller mines tributary to the city.

A NEW PROCESS OF REDUCTION.—Professor James Warren, of the electric light station, is the inventor of a new process of reducing ores, which is done by the aid of electricity. One day while examining a piece of gold bearing quartz he accidentally let it fall into one of the dynamos, which was in motion at the time. On looking for the piece of quartz the next day, he found it in the dynamo, and to his surprise the gold in the quart had been melted and had run to one side of the rock, forming a beautiful button. Professor Warren immediately instituted a series of experiments, and has succeeded in copper can be instantly smelted from concentrations by a powerful electric shock, which almost equals in its intensity a stroke of lightning. The experiments so far have [illegible] lead and antimony ores, but he hopes [illegible] cessful also with them. Several [illegible] to be successful offered to put Professor Warren's capitalists have practical operation, but [illegible] back till the patent [illegible] sor Warren is also [illegible] fully perfected. Professor new kind of [illegible] at work on the model of a tionize [illegible] dynamo, which promises to revolutionize the electric world.—*Los Angeles Herald.*

The Bullion Tax in Nevada.

It is generally conceded in mining circles that the coming Legislature will take some action in regard to the bullion tax, and thereby contribute to the welfare of what is emphatically the leading industry of our State. When this Act was passed, it was universally considered a just levy, but the reasoning brought to bear at that time, in favor of the bill, has been stripped of its logic by changes and the lapse of time. Then mining was in a vigorous state, and silver was pouring from the earth in a steady stream. Other industries were struggling, and the receipts from the bullion tax undoubtedly encouraged many other enterprises in the State by lessening taxation that otherwise would have been a heavy burden. The demonetization of silver and the bullion tax added to the discount has had a disastrous effect upon the mining interest—in fact, it is literally crushing the industry that made the State and filled the coffers of the world. Every branch of trade has been more or less effected by the decline in mining, while thousands of commercial enterprises that flourished during the "palmy" days have been wiped out of existence or planted elsewhere. Our mineral fields are not exhausted by any means, but will never be developed in the manner they should while weighed down by an unjust and now burdensome tax.

Every year millions of dollars are appropriated by the general Government, to be expended upon harbors and rivers: or, in other words, to remove obstacles that beset navigation. If benefits are derived from such expenditure, and such is assuredly the case, will not the same rule apply to any other channel of trade? If these appropriations were not made, if obstacles were not removed, how long would it be before shipping would be driven from the rivers and harbors of our country? To encourage prosperity, everything of whatsoever nature that acts as an interruption, must be removed. Nineteen per cent of the product of a mine, is a total loss to the producer. It certainly requires no very high degree of intellect to discover that such a sacrifice is damaging to the industry, a serious obstacle in the way of mining prosperity. To encourage and revive an industry that has been of such incalculable benefit to the State, is certainly a duty, and the repeal of the Bullion Tax Act, would be a decided step in the right direction. Money, like human beings, is migratory, and where it can be used to the best advantage, there it will surely go. Every act that has a tendency to invigorate trade in any locality, acts also in bringing capital to that particular point. Offer inducements to the miner, clear the way for his prosperity, and the door of possibility is opened to other industries that are invariable accompaniments of successful mining.—*Silver State.*

We believe the above argument is sound and wholesome. It would have been very unpopular, if, in fact, it could have been offered eight or ten years ago. Then mining was a big game, and could stand almost any tax. Then anything like a proposition to repeal or modify the bullion tax, was regarded as a scheme to release the bonanza kings from their share of taxation and to place on citizens of small means almost the entire load of the State and county governments. It is about time now, that something positive be done to help out our languishing mining industry. This industry has stood terrible tax punishment in its better days for the sake of other industries. The latter, principally that of stock-raising, which can afford to do so, must be required to stand squarely in the breach.—*Eureka Sentinel.*

THE LEAD MARKET.—From all appearances our lead miners should not lose heart. It seems to us that there must soon be a real advance in the price of lead. There is but a small stock on hand. We have not the figures, but we do not think that all Utah, Idaho and Montana are producing as much as the Eureka Con. and Richmond Companies in Eureka were producing four or five years ago. We believe the present depression is due to a bear movement in New York and London, which is simply a speculation on the fears of the people. We believe the efforts being made at Washington to abolish the present duty on lead will be neutralized. We have a competent representative there, who understands the question thoroughly. As soon as it is known through mining circles that all hopes of the removal of the present tariff are vain, the old price will rule again, for the consumption of lead is speedily increasing, and the amount on hand is small.

THE GALT LUMBER Company has sold over $20,000 worth of lumber to residents of Ione, with estimated orders for nearly $6,000 more. This company, in its various ramifications,

Columbite in the Black Hills of Dakota.

Columbite associated with cassiterite, albite and mica occurs in several of the coarsely crystalline granite dikes which traverse the mica schists and sandstones of Pennington county, Dakota. The most notable localities are at the Etta mining claim and at the Ingersoll, about ten miles east of Harney Peak. At the Ingersoll claim, particularly, a mass of unusual dimensions was found protruding from a matrix of albite and quartz. This mass consisted of nearly pure columbite, with here and there inclusions of thin sheets of quartz. It measured, approximately, 20 inches square by 24 in length, weighing by calculation, taking the specific gravity at 6, not less than 2,000 pounds, or one ton. On blasting it out it broke up generally into tabular fragments without crystalline planes, except at the lower or imbedded end where it was enclosed in quartz, into which it penetrated in thin, tabular crystals with brilliant prismatic and terminal planes. At the Etta, on the contrary, the best crystals are taken from the albite, and are more distinct and separate than at the Ingersoll claim.

In breaking up the large mass I found several cavities filled with a beautiful yellow powder, often in pellets and pill-like balls. These prove to be chiefly hydrous uranium oxide, without sulphuric or carbonic acid. A similar mineral occurs at the Etta, but gives different reactions.

The blow-pipe reactions of the columbite from the Ingersoll claim are peculiar in the amount of manganese indicated. With borax, in O. F. the bead is dark amethystine red, and in R. F. a pale amber yellow. The purity of this reaction for manganese is not impaired by any other metallic reaction. With phosphate of soda and ammonia in O. F., the mineral dissolves to a clear glass, red while hot, yellowish-red while cooling, and when cold clear and nearly colorless, with a pale rose colored or amethystine tint. In R. F. the bead is beautiful amber-yellow, and there is no shade of green or reaction for uranium. On foil the manganese reaction is distinct. Treated with concentrated sulphuric acid, and evaporated to dryness, the powdered mineral is partially decomposed. With the addition of a second portion of acid, the solution gives with zinc the intense sapphire-blue reaction.—*Wm. P. Blake in Amer. Jour. of Science.*

Old Dominion Copper Co.

Through the courtesy of Superintendent Trippel, a representative of the *Belt* was permitted on Wednesday of last week to view and examine the works of the Old Dominion Copper Company. The equipment of the mine and plant until recently was very crude, and inadequate to the requirements, but the work, which was in an unfinished state when the present management assumed charge of the property, has been energetically pushed to completion, and other much needed improvements are being made, all of which will greatly facilitate and cheapen the handling of the ore. Probably the most important item in this connection is the straightening and enlarging of the main tunnel, over 1,000 feet in length, and the laying of a track through it, which has just been finished. Near the mouth of the tunnel a substantial ore bin, with a capacity of 200 tons, has been erected. This bin is to be connected with the dump by a trestle, work on which will be begun immediately. It is expected that this will be completed by January 1st, and all the ore from the Old Globe mine, which is now raised from the main air shaft, will then be delivered into the new bins through the tunnel. This change will make a considerable saving of labor and expense in handling the ore.

At the entrance to the tunnel a blacksmith shop has been built, and a large house for the carpenter is also being put up. Other improvements, lately made, were noticed: A hood, which was greatly needed, has been placed over the main air shaft, and the engine and boiler, connected with the new hoisting works, have likewise been enclosed by a frame structure. Another desirable work now progressing, is the construction of a road, several hundred yards in length, to connect the Alice claim with the main avenue of the company, and the intervening arroyo will be spanned by a durable trestle. On the Alice claim, controlled by the Old Dominion Company, a new shaft is being sunk with a view of better developing that property. At the smelter we observed that a new coke bin was being built and other lesser improvements made. In the mine an immense amount of timbering and development work has been done. It is now proposed to sink a shaft 400 feet ahead of the extremity of the present works, in order to better open the mine. Nothing practical, tending to economic management, is being overlooked.—*Arizona Silver Belt.*

SHASTA COUNTY timber resources seem almost inexhaustible. There is a vast acreage of most magnificent pine, cedar and fir timber in almost all parts of the Sierra Nevada Mountains from the extreme south of the county to the farthest point north. A number of saw-mills are in active operation, and a great enterprise has been inaugurated to float timber down the Pitt and Sacramento Rivers, to be manufactured into lumber near Redding. Large bodies of splendid oak trees are found all through the mountain region, and in many places there is a

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SHIP'S STEERING APPARATUS.—Chas. F. Rodeen, S. F., assignor of one-half to Chas. Nelson. No. 308,804. Dated Dec. 2, 1884. This invention relates to that class of ship steering gear in which an endless chain is employed to transmit power from the wheel to the tiller, and the invention consists in a reciprocating traveler connected with the tiller, and in a novel arrangement of blocks and shieves, used in the course of the endless chain. The object is to provide a means by which sufficient purchase can be brought to bear readily to operate the tiller and hold the rudder in any given position to prevent its "kicking."

STEAM BOILER.—Wm. Kincaid, Oakland. No. 308,677. Dated Dec. 2, 1884. This consists of a series of short tubes, closed at one end and opened at the other. These tubes are used in connection with the double walls or water legs of boilers, the open ends opening through the inner wall into the furnace or fire box, while the rear or closed ends have bolts extending outward from them, and through the outer wall, so as to form stays for holding the walls in place, as well as providing an extra heating surface.

WAX EXTRACTOR.—Joseph D. Enas, Napa. No. 308,958. This is a wax extractor of that class in which the combs are confined within a foraminous vessel encircled by a suitable steam jacket, and having a central passage by which steam is admitted to the center of the mass of combs; and the invention consists of an underlying body of water into which the melted material drips, and from the surface of which the wax is allowed to overflow while the sediment is drained off from below. It consists further in the peculiar arrangement and construction of vessels and detail. The object is to provide a simple, effective and easily-operated device for extracting the wax from honeycombs.

CENTRIFUGAL HONEY EXTRACTOR.—Oliver P. Squier, Santa Barbara. No. 309,003. Dated December 9th, 1884. This invention relates to that class of centrifugal honey extractors in which the pockets or frames containing the combs are arranged in the circumference of the rotating basket, whereby the honey is thrown from the side of the pockets into the vessel or case in which the rotating basket is mounted; and the invention consists in a peculiar connection between the several pockets, whereby, through the movement of the one, all of said pockets are simultaneously reversed, in order to present their opposite sides outwardly, that honey from both sides may be extracted in the course of the operation. The object of the invention is to so connect all the pockets that all of them may be reversed easily and at the same time, thus obviating the necessity of removing them from the basket in which they are mounted, or of employing time in turning or reversing each pocket separately. The means shown for accomplishing the result seem simple and effective.

COLORADO'S PROBABLE OUTPUT.—There is some little uncertainty as to what the ore product of Colorado, New Mexico and Arizona will amount to this year, as well as to how the output of each section will compare with that for 1883. Arizona and New Mexico have had much to contend with—the shutting down of the Tombstone mines in the one Territory and the business failures and consequent stoppage of work in the other—but the sections are new and the record comparatively small, so that it is more than probable that the output from the new mines and new districts will more than make up the deficit and probably give a considerable increase in New Mexico and some gain for Arizona. About Colorado there is considerable difference of opinion, but from data at hand we figure as follows: There will be a considerable falling off from Leadville; Clear Creek county will lose about $100,000; while Summit, Gunnison, Fremont and perhaps one or two counties, will show losses; Chaffee, Pitkin, San Juan, Ouray, San Miguel, Dolores and Lake will make radical gains, while one or two other counties will gain something. The question is, will San Juan, Ouray and San Miguel counties make up for the loss to Leadville? We fear not, because we believe that loss will amount to several millions; and an increase of two or three millions in these counties is all and more than can be hoped for. From this we argue that the product of Colorado will be several millions less for 1884 than for the previous year. There is just a possibility that the falling off in Leadville will not be so great as is now feared, and upon this only we hang the hope of Colorado holding her own.—*Rocky Mountain Mining Review.*

H. C. FARNHAM has got his new saw-mill, which is in El Dorado county, in good running order, and is turning out some splendid lumber. He has a lumber yard in Oleta, Ione and Plymouth, all of which seem to be doing a good business.

THE LARGE SASH and door factory of Florin Bro., at Fall River mills, Shasta Co., is now in

ENGINEERING NOTES.

The Manchester Ship Canal.

The great scheme of the Manchester Ship Canal, says the London *Daily News*, is to be brought before Parliament in the coming session. In a former year it passed the Select Committee of the Lords, to be lost in the same stage in the Commons; last session it got through the Commons Committee, to be rejected by that of the Lords. The main contention of its opponents was that the scheme in the form in which it was then proposed would be seriously injurious to the channel of the Mersey. The committee in the Lords were not fully satisfied that this objection had been shown to be groundless. The scheme has now been remodeled, and may be briefly described as one for the formation of a ship canal, navigable by the largest vessels, from Manchester through Warrington to the estuary of the Mersey near Eastham. The distance is some 30 miles, and, though for a large part of the way the country is favorable, considerable engineering difficulties have to be surmounted. It is one of the busy districts of England. It is traversed by various great canals, by many large lines of railway, and by two tidal rivers. To take through such a district a vast waterway along which great steamers and ships with lofty masts can make their passage in safety is one of the most difficult undertakings suggested in modern times. The scheme, however, is well thought out, and provision is made for all the inevitable interferences it must make with other enterprises. The proposal may almost be said to involve a reconstruction of the transport arrangements of the valleys of the Irwell and the Mersey: By the completion of this great work Manchester and its great ring of towns will be practically put upon the sea. Ships would load and unload on its own quays, and the beginning of the voyage of its exported goods and the ending of the voyage of the raw material would be at the doors of the manufacturers instead of 30 miles away. It is clear enough that if this can be brought about without imposing too heavy a tax on the trade there might follow a considerable expansion of the business of which Manchester is the center. Liverpool would probably meet the competition by new facilities and reduced charges, and both ways the cotton trade and other great industries would be vastly benefited. It is thought that Parliament will now no longer refuse to pass the enabling act.

THE TREATY WITH NICARAGUA.—One of the most important announcements made in the President's message was that the Government has concluded a treaty with the republic of Nicaragua for the construction, by the United States, of a canal, railway and telegraph line across the Isthmus.

The route over which it is proposed the Government shall build a canal lies between Greytown on the Atlantic and Port San Juan del Sur on the Pacific. Surveys have been made of this route several times, and it is highly commended. The proposed line of canal will pass directly through Lake Nicaragua, which is 90 miles long and 40 miles wide. Its waters are fresh and of sufficient depth to float vessels of the deepest draught. There are also several islands in the lake which can be utilized for repair and supply stations. The lake is 110 feet above tide water, and six locks and five intermediate levels will be required for the Pacific side of the canal. On the Atlantic side five locks and four intermediate levels are proposed. These locks, an authority says, would no more limit the number of vessels passing through the canal than would a single tide-lock on the Pacific end which is necessary to any route, even by a level sea way. The canal would have to be dug 17½ miles to unite the waters of the Pacific with the lake. Upon the opposite side 36 miles will have to be excavated, making a total of 53½ miles and 119 by canal, river and lake. The distance between San Francisco and New York will be shortened 10 days. The estimated cost is from 43 to 75 millions.

"OCEAN GREYHOUNDS."—The steamships plying between England and New Zealand are among the "ocean greyhounds." They have done the enormous distance of late in little over 37 days. Writing of this, a correspondent of the London *News* ecstasizes as follows: "Talk of the age of miracles! Here is an exploit far transcending any conceivable mediæval myth; and if all its bearings are duly considered, I venture to say far transcending also in importance to the English people any political change that could possibly be effected by Parliament. Here is a second England brought 5,000 miles nearer than it ever was before. With an area equal to that of the older one, and a climate infinitely superior, she yet has but 500,000 of population to the 40,000,000 of the mother country.

THE SUEZ CANAL TO BE WIDENED.—In regard to what shall be done to accommodate the rapidly increasing commerce crowding upon the Suez Canal, Count de Lesseps and the commission have completed their examination of the canal at Ismailia, and approved the plans for widening the waterway.

USEFUL INFORMATION.

The Cochineal Insect.

The appearance, habits and mode of collecting this singular and very useful insect is given as follows: "One of the best and most powerful animal dyes used in the arts and manufactures is the body of the female cochineal insect, dried. This insect exists on a species of cactus, and when alive is about the size of a lady-bug, or perhaps a trifle smaller. It is wingless, rather long, equally broad all over, and is marked behind with deep incisions and wrinkles. It has six feet, which, curiously enough, are only of use directly after birth, and it secures itself to the plant by means of a trunk, which is found between the forefeet, and derives its nourishment from the sap. The male cochineal is like the female only during the larva period. It changes to chrysalis, and eventually appears as red flies. The female deposits some thousands of eggs, which she protects under her body until they are hatched, and on the appearance of the young ones the parent dies. While the young are in the larva state, their sex cannot be determined. They lose their skins several times, and while the female fixes herself on the plant, the male, after getting over the pupa state, is winged. Two or three months is the extent of the life of these little insects. They are gathered before they lay eggs, and are then rich in coloring matter.

"Carmine is prepared from the cochineal insect, the *Coccus acti*, which is collected by brushing the branches of the cactus with the tail of a squirrel or other animal. This is very tedious work. They are killed by immersing them in boiling water, and this has to be done or they would lay their eggs, and thereby lose much of their value. There are many processes for preparing the carmine. The French process may be taken as an example. One pound of powdered cochineal insects is boiled for fifteen minutes in three gallons of water; one ounce of cream tartar is then added, and the boiling is continued ten minutes longer; then one ounce and a half of powdered alum is thrown in, and the boiling continued for two minutes longer. The liquid is then poured off and set aside for the carmine to settle down. In other processes carbonate of soda for potash is used."

HOW TO TAN SHEEPSKINS.—Where farmers kill but a few sheep during the season they can make better use of the pelts than to sell them if they know how to preserve them. For mats, take two long-wooled skins, and make a strong suds, using hot water; when it is cold, wash the skins in it, carefully squeezing them between the hands to get the dirt out of the wool; then wash the soap out with clear cold water. Then dissolve alum and salt, each a half pound, with a little hot water, sufficient to cover the skins, and then let them soak in it over night for twelve hours; then hang over a pail to drain. When they are well drained, spread or stretch carefully over a board to dry. When a little damp, have one ounce each of saltpeter and alum, pulverized, and sprinkle on the flesh side of each skin, rubbing in well; then lay the flesh sides together, and hang in the shade for two or three days, turning the under skin uppermost every day until perfectly dry; then scrape the skin side with a blunt knife, to remove any remaining scraps of flesh. Trim off projecting points; rub the flesh side with the hands. They will be very white and handsome, suitable for a door or carriage mat. They also make good mittens. Lambskins, or even sheepskins, if the wool be trimmed off evenly to a half or three-fourths inch long, make beautiful and warm mittens for ladies or gentlemen, and the girls, with a little practice, can make them.

SHEEPSKIN LEATHER.—The uses for which leather made from sheepskins is employed are almost numberless. Sheep are raised in large numbers over so great a portion of the earth's surface that the supply of raw skins is immense, and, tanned with either bark or sumac, or tanned with alum, it can, although possessing much less strength than the goat skin, be finished to imitate almost any description of light leather. It fills a large place for linings and facings of boots and shoes; its use for bookbinding far exceeds that of all other kinds of leather together; it is almost the only kind of leather employed for hat linings, and for pocket-books, ladies' belts, satchels, toilet cases, furniture coverings, and the thousands of lesser articles in which leather is used, sheepskin is more employed than any other kind, particularly in articles to be sold at a low price.

SIMPLE TEST FOR GLUCOSE IN SUGAR.—The simplest and best test is to place a little of it under the low power of a microscope. Magnifying forty times is quite sufficient, and less will do. Cane sugar under this power is distinctly and beautifully crystalline, and each crystal looks like rock candy. They are clear, bright and beautiful. Glucose, on the other hand, has a dull, opaque appearance, like a lump of tallow. Once seen, it will be easily known ever after.

SEPARATION OF WOOL FROM COTTON.—Aeddehault has devised a new method for the separation of cotton from wool when the two fibers are mixed, as in rags, etc. The rags are simply subjected to the action of a jet of superheated steam. Under a pressure of five atmospheres the wool melts and sinks to the bottom of the receptacle, while cotton, linen and other vegetable fibers stand, thus remaining suitable for the paper manufacture. The liquid mud which contains the wool thus precipitated is then desiccated. The residue, which has received the name of azotine, is completely soluble in water, and is valuable on account of its nitrogen. Moreover, its preparation costs nothing, because the increased value of the pulp, free from wool, is sufficient to cover the cost of the process.

WASHABLE COATING FOR GYPSUM FIGURES.—According to C. Puscher, 3 parts of caustic potash are dissolved in 36 parts hot water, 9 parts of stearic acid are added, and the obtained soap paste is diluted with the same quantity water and 95 per cent alcohol. The warm solution is applied upon the warm gypsum cast, and this, after a few hours, is repeated with wet sponge. The casting becomes still handsomer if, in place of potash, a corresponding quantity of ammoniac is used. Old casts are first cleaned with a 3 per cent caustic potash solution.

TO POLISH FINE CARVED WORK.—To polish fine carved work, take a half pint linseed oil, half pint of ale, the white of an egg, one ounce French spirits, one ounce of spirits of ammonia; shake well before using. A little is to be applied to the face of a soft linen pad, and lightly rubbed for a minute or two over the article to be restored, which must afterward be polished off with an old silk handkerchief. This polish will keep any length of time, if well corked. It is useful for cabinet work, and is also recommended for papier-maché work.

COLORLESS CEMENT.—The following receipe is said to produce a perfectly colorless cement. In an air-tight bottle 75 grammes of india rubber cut into little pieces are mixed with 60 grammes of chloroform. After complete solution of india rubber, 15 grammes of mastic are added, and the mixture warmed eight days till the latter dissolves also.

UTILIZING HORSE MEAT IN LONDON.—Three thousand horses die each week in London. Their carcasses are purchased by a company which delivers meat for cats and dogs to many thousands of customers. There are 700,000 cats in the city.

GOOD HEALTH.

The Adult Blind.

California makes no provision for her adult blind. They are not very numerous, but on account of accidents around mines and machinery, of mishaps by flood and field, there are a greater percentage of the total blind than in an Eastern population. They are usually of the class of laborers and mechanics, men whose sight is accidentally eclipsed at a time of life when they have no great accumulation of property, but are industrious and capable of self-support even in their blindness, if the State, which reforms criminals and cures the insane and homes the crippled, will give them a chance to learn the blind trades. We have a blind asylum which is under excellent and enlightened management, but the law excludes the adult blind, therefrom, and the mangement is obliged to obey the law.

The Legislature makes the law. For that purpose the Legislature is the State of California, and does this great State, whose name is in literature a synonym for wealth, used like Golconda and Ind, as a term convertible with gold and glitter, propose longer to disgrace herself by forcing her adult blind to beg on the streets for the poor crusts and cup of water to keep them alive while they implore her to give them a chance to acquire the simple mechanical knowledge of the blind trades which will make them independent and self-supporting?

If this Legislature adjourn without doing something in this behalf, its members should be marked for future use when we seek a work that implies coldness of heart and the cruelty of uncharity. We solicit the ever ready pulpit to remember the Master and Bartimeus blind, and add its voice and influence to the press to call the attention of our law-makers to this prime need of the State. We know the Legislature will be kind to these unfortunates and we believe it will refuse to adjourn until it has made the amplest provision for their reception into comfortable public quarters equipped with machinery and supplied with instructors who will teach its use and make them self-supporting. We have said that this is our business with the Legislature. Reader, it is also yours; it is, in fine, the business of every charitable man and woman in California. Let us pull all together and accomplish it.—*Oakland Times.*

The Hydrochlorate of Cocaine.

The *Druggist* regards the anæsthetic properties of hydrochlorate of cocaine as one of the most remarkable discoveries of recent times.

It has so far been employed with uniform and marked success as a local anæsthetic to the eye, nose, mouth, uretha, and other mucous surfaces. Painless operations have been performed on these parts, while the patient suffers none of the discomforts attending the use of general anæsthetics, as chloroform or ether. A solution of one grain of the hydrochlorate of cocaine, in about 30 minims of water, is sufficiently strong for use in operations on the eye. A few drops will gradually render the parts insensible. It may be applied either by dropping, or with a camel's hair pencil. The anæsthetic effect on the cornea begins after a few minutes, and is usually completed in about 10 to 20 minutes, and begins to decrease after half an hour. Dr. H. Knapp, the professor of opthalmology of the medical department of University of New York, made numerous experiments, several of them upon himself and other members of his family.

Cocaine is a mydriatic, but is not poisonous, like the other alkaloid mydriatics. We believe this to be the first instance of a non-poisonous local anæsthetic drug on record. The cocaine is obtained from cocoa leaves, which yield about one-fourth of one per cent, or less, according to quality. It will next be interesting to learn what relation the now well-established local anæsthetic effect of this alkaloid bears to the already known and extensive uses of cocoa and its fluid extract. As cocoa and cocaine have been observed to exhibit the same or very similar properties as are obtained from coffee, guarana and tea, and their respective alkaloids, it is not impossible that one or more of the latter may also be found to have local anæsthetic effects.

The Use of Chloral and Bromide of Potassium.

The following, from the *London Lancet*, has more especial reference to the use of the above remedies by persons in comparative health,—to its use by such as opium is frequently used. But it is well, also, that the character of these remedies should be known by all. The *Lancet* says:—Again we have to record, with deep regret, a sad proof that those who give or take chloral or bromide of potassium for sleeplessness are guilty of a deplorable error and do a grievous wrong. The narcotics which poison sleep also deprave the higher nerve centers, enfeeble the controlling powers of the will and leave the mind a prey to the depressing influence of a conscious loss of self-respect and self-confidence. The cultured mind feels the ignominy of the intellectual and moral depreciation with great acuteness, and in the end succumbs to the sense of powerlessness to recover self-control and do right. The deprivation wrought is purely physical. The baneful influence of the lethal drug is, so to say, organic. The essential elements of the nerve tissues are blighted by the stupifying poison, as by alcohol in habitual drunkenness. In short, the recourse to chloral and bromide is precisely the same thing as recourse to alcohol. The man or woman sent to "sleep"—the mocking semblance of physiological rest—by a dose of either of these narcotizers is simply intoxicated. No wonder that habitual drunkenness of this class first impairs and then destroys the vitality of the mind organ, and places the subject of a miserable artifice at the mercy of his emotional nature, and makes him the creature of his passions. When will the public awake to the recognition of facts with regard to these most pernicious of stupefacients? Persistence in recourse to them has no better excuse than unwillingness to search out the cause of the wakefulness which prevents natural sleep.

WATER REQUIRED.—The amount of water required for the human system is from four to five pounds per day. Part of this is, of course, supplied by our food, but not all. Those who eat much salty or highly-spiced food require the most. The man who consumes much fruit requires much less drink. It is an excellent plan, when possible, to take our liquids as much as possible in the form of fruits as, in spite of all our precaution, most water, unless distilled, is more or less loaded with impurities of some sort, and often of a dangerous character.

FOOD FOR THE OLD.—An old person neither has the appetite, the power of digestion, nor the demand for food that younger persons have, and it is a dangerous plan to feed him too largely or luxuriously. His body is less active, his lungs take in less oxygen, his blood flows more slowly, his mind acts less vigorously, and to this lower change of vital activity, his food must be accommodated.

CREAM FOR INFANTS.—Struve upholds Dr. Biedent's suggestion that only cream should be used for the earliest nourishment of young children brought up by hand, as the digestibility of any milk is inversely as the quantity of caseine which remains in the skim milk.

A GOOD GARGLE.—A gargle made of strong black tea, and used cold, night and morning, is now the fashionable preventive in London against falling a victim to sore throat during the cold winds of spring, and similar "cold spells" at other times of the year.

TO GIVE CASTOR OIL.—The French method of administering castor oil to children is to pour the oil into a pan over a moderate fire, break an egg into it, and stir up; when it is done, flavor with a little salt or sugar, or currant jelly.

TO REMOVE WARTS.—Dr. Et Guenot reports that he has removed a large crop of warts occurring on the hands of a patient by giving daily a ten-grain dose of calcined magnesia in the morning before breakfast.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

COMMENCED OPERATIONS.—Amador *Ledger*, Dec. 27: Hadley and Cassinelli, of Volcano, have commenced operations on the old Siebenthaler quartz mine, situated about five miles north of Volcano. They have purchased the Golden Gate hoisting works, and have already moved the machinery to the mine. Six to eight men are employed, and it is reported that good rock has been struck in sinking. At the Marlette quartz claim, at Middle Bar, some very rich metal has been taken out within the last few weeks. The claim is worked by means of a tunnel, which is 40 ft from the surface. In this tunnel a shaft has been sunk about 60 ft. The water in the shaft is troublesome, and has compelled a suspension of work for the present. At the McKinney and Cranis quartz claim, also located at Middle Bar, two men are employed. A shaft has been sunk 100 ft, and a drift run west 15 ft, with indications of soon striking pay ore. Messrs. Reed and Sidney Smith are working away at the St. Louis mine, near Irish town. They can take out and crush on an average about three-quarters of a ton per day. The crushing is done by an arastra. At this rate it pays fair wages, the ore yielding from $10 to $12 per ton. The big tunnel at Middle Bar is now in a distance of 1700 ft. The header is in slate and quartz. It is believed that the tunnel has struck the line of the main ledge at a barren spot between two ore chimneys. The Mammoth mill was to be started up to-day, Friday. The latest excitement in quartz is a strike in the yard of Mrs. Judge Moore, just behind the house. Some of the quartz shows free gold. The ledge was found close to the surface. A man, we understand, will be put to work to-day. It is a very likely place to strike a pocket, being on a line with the Hinckley mine, which has yielded richly in pockets.

THE ST. JULIEN.—Amador *Sentinel*, Dec. 26: We learn that work on the celebrated St. Julien mine, which has been in *statu quo* for some time past, has been resumed, and we confidently expect soon to be able to record further instances of its wonderfully rich productions.

PLYMOUTH.—Cor. Amador *Dispatch*, Dec. 27: Mining is still being pursued by anxious speculators in this vicinity, and all along that portion of the mother lode that is as yet untouched, comprising a distance of six miles south of the Pacific and ten miles north of the Empire. This mentioned space might be properly called an undeveloped field of gold, and capitalists who seek investment for their money can surely find no better place in the wide world than along this portion of the mother lode that is as yet unknown, so to speak, and still has a wide reputation. I predict that another 20 years will not only see that portion of this ledge north of Plymouth a continued string of quartz mines, but that it is now a true foundation for a city of 50,000. This may seem like a wild conclusion, but if the reader lives in this county these 20 years he will surely see these statements verified. Already this ledge is being tapped in a few places on this line. At Enterprise a shaft has been sunk to the depth of 400 ft. They are now drifting for the ledge, which they expect to reach by spring. Still this side (south) of Enterprise is the old McGuire mine, which is now being emptied of its water preparatory to being put in operation. This mine is known to be first class.

Calaveras.

CLEAN-UP.—*Mountain Echo*, Dec. 27: A clean-up was made at the Matson mine the other day, which consisted of a five days run. The ore paid a fraction over $4 per ton. This, of course is not a rich yield, but when we consider that the lead is more than 50 ft wide and can be extracted for less than 50 cents a ton, it becomes a big thing.

PUMP.—Bechtel, the owner of the Stickle mine, is using one of the New Era Duplex Steam pumps. It was started the other day, and is one of the most remarkable pumps ever brought to this section. The valve motion is the prominent and important peculiarity of this pump. At a stated number of strokes, say 100 per minute, this pump will throw 185 gallons of water, making 11,100 gallons per hour.

THE STORM.—Calaveras *Chronicle*, Dec. 27: Dams have been carried away, mines filled with water, mining property damaged, and roads washed out and otherwise made impassable, and travel interrupted. There is not a claim in Chili gulch or on Tunnel ridge but what has suffered damages, by caves, filling in with water, breaking dams, etc., causing losses and temporary suspension of operations.

MURPHYS.—Cor. Calaveras *Citizen*, Dec. 27: The activity now noticeable in our neighboring district of Angels, and the wave of prosperity that overspread it, is sure to extend here sooner or later, when a showing will be made that will compare favorably to any district in the State. Among the mining industries now in successful operation in our midst is the "Oro Plata Mill and Mining Co." There are seven mines belonging to this Co. Six of these mines carry ore similar in character, containing gold, silver, and other minerals, and the ore is high-grade and rebellious. A large excavation was made some 80 ft deep on the "Red Wing," near the Oro Plata line in apparently an unlimited body of free-milling ore—low grade. To test the practicability of reducing this ore at profit, a 15-stamp mill was erected this summer. This mill has now been in operation some two months. A screen is used admitting the reduction of 85 tons of ore per 24 hours, and during these two months 2,000 tons of ore has been reduced. The company based their calculations of extracting and reducing this ore at a profit approximating $2 per ton, and as the result of the past two months crushing has proven that the average run is over that figure, it may be set down that they have demonstrated beyond the possibility of a doubt that ore can be worked at this mill at a profit at less than $3 per ton. The company have run 400 ft of tunnels, drifts, etc., most of which were in solid rock the past year. The adjoining district north of Murphys, on Indian creek, is Washington, and is remarkable for its high-grade ore, good-sized veins, and excellence of formation. It contains some of the oldest, and most marked mines in this section. Perhaps the best known among these are those belonging to the Calaveras Gold Mining Company—the Oro Minto and the Enchantress. The Oro Minto has two shafts, one 325 ft deep and one 400 ft deep. On the latter is the hoisting works driven by a 100-horse-power engine.

Mariposa.

HORNITOS.—Cor. Mariposa *Gazette*: Before long we shall see men with picks and shovels and pans scratching the bottom of every gulch in search of gold. Want of water is a great drawback for placer mining in this county. Hundreds of places known to contain gold, cannot be worked in dry weather. In the winter season, we take advantage of rain and dam up the surplus water and work, but in the dry season we have to turn our attention to other things. Mining suffers thereby, and if we had water enough many a poor devil would have gold in plenty. Work has been suspended at Quartz Mountain, and will be until the rain ceases. The machinery is nearly all on the ground and it is the intention of the owner to put up a 10-stamp mill to thoroughly prospect the mine before engaging in bigger work. The large 10-ton boiler of the Washington was taken to Quartz Mountain and masons are waiting for a few days of dry weather to put up the brick-work. The owners of the Three Oaks and Honeycomb mines, Mrs. E. Merck, is having some 35 or 40 tons of quartz got together and ready to haul for crushing at Barcroft's mill. It is thought that this quartz will pay from $30 to $35 per ton, and some mining experts think the expectations will fall short of realization.

Nevada.

RAINS. — Grass Valley *Union*, Dec. 26: The heavy rains of the past week have placed an embargo on quartz prospecting. On account of the storm and soft condition of the roads quartz teamsters have been idle for the past week. The water in the North Star mine was lowered 90 ft last week. The 500 level will be clear of water next week. A force of tributers will soon be put to work in the upper levels of the mine. The machinery on the Horseshoe was found inadequate to contend with the great inflow of surface water caused by the recent heavy rains, and operations have been suspended for the remainder of the winter. When work is resumed in the spring a water-wheel of much larger capacity to furnish power for pumping will be put up. The crushing of rock from the mine, made just before the commencement of the storm gave a profitable yield, and the mine was showing well for future operations. The third installment of 25 per cent on the $40,000 subscription to the working capital of the North Star Mining Company has been called for, payable January 10th.

WILL NOT PAY TO DRIFT.—North San Juan *Times*, Dec. 27: Our special correspondent at Bloomfield writes us that on Tuesday of last week the Malakoff Company discharged 24 of their employes and that in the near future all the men employed except 2 will be discharged, as the company has concluded that the mine will not pay to work it by the drifting process. The Delhi quartz mine near Columbia Hill is developing some very rich rock, and gives promise of becoming a mine equal, if not superior, to the celebrated Idaho mine at Grass Valley. A ton of rock taken from the 100 ft level yielded $97. An assay of rock taken from a lower level yielded at the rate of $400 to the ton. The owners of the ledge have a large number of men at work taking out rock, and they are constructing at the ledge a 10-stamp mill with improved machinery. They have a crushing machine on the ground now which performs good work.

Plumas.

THE ANO MINE.—Greenville *Bulletin*, Dec. 27: Mr. Standart informs us that the Arcadian mill, which has been run 16 days previous to the heavy storm, has stopped until the weather and the condition of the roads will permit the hauling of ore from the Ano. As a result of the 16 days' run, over 300 ounces of amalgam was obtained. Considering the small force employed in the mine, this is a most satisfactory showing, and it speaks well for the property. The Ano mine is owned by Standart and Davis. There are numerous mines in the district, which, if, in the hands of an experienced, economical and business superintendent, as Mr. Standart has shown himself to be, would pay well.

LIGHT'S CANYON.—Plumas *National*, Dec. 27: Mr. A. J. Ford informs us that the Engle Bros. are still at work on their copper ledge in Light's canyon, and have developed a large ledge that prospects well. Their mine is very extensive, and sure to prove valuable when thoroughly opened. The boys are pure grit, and deserve to become millionaires.

San Bernardino.

MINING PURCHASES.—Calico *Print*, Dec. 27: Recently R. B. Johnson purchased interests in mining property as follows: He bought the Mountain Chief mine, situated a half mile east of Calico, and extending to Deep canyon. It is bounded by the following mines: On the west by the Nellie, east by the Big Chief, south by the Bull's Eye, and north by the McCullough. The Mountain Chief is favorably situated and prospecting on the same has been attended with favorable results. No work has been done on the mine other than assessment work and prospecting. He bought a one-half interest in the Spar ledge, which takes its name from the character of the rock in the ledge. This mine is situated 600 ft southwest of the King mine, and is of the same formation as the latter. It runs parallel with Red Cloud which joins it on the east, and is bounded on the west by the Hillside and Moran mines. The assessment work has been done on this mine and the work of prospecting showed up so well that Mr. Johnson was induced to purchase a half interest. H. B. Stevens owns the other half interest in the mine. Mr. Johnson bought entire the Canyon mine, about three-quarters of a mile in an easterly direction from Calico, and is bounded on the east by the Big Chief, and on the west by the Bull's Eye. The assessment work has been done on this mine and while being prospected some ore was taken out that assayed $125 to the ton.

SANTA MARIA.—Work is progressing on the Santa Maria mine, which is parallel with the Blackfoot, and the showing is good, some rich ore having been taken out recently. This mine is joined on the south by the Golconda, on the east end by the Sam Houston No. 3 and on the west end by the Alhambra. The owners of the Santa Maria are R. B. Jonnson, of Los Angeles, and Frank Locan, of San Francisco, the former owning a one-third and the latter a two-thirds interest. This mine is quite favorably located in the midst of fine properties and we may reasonably expect developments that will lift it into importance as a bullion producer.

KRAMER.—J. L. Coffman came to town last Monday and brought with him some samples of ore from his mine at Kramer, which were assayed by G. E. Thede, resulting in $93 gold and 13 ounces silver to the ton. This ore was taken at a depth of four ft from a four-ft ledge consisting of a solid mass of quartz rock.

Shasta.

SOLD.—Shasta *Courier*, Dec. 27: The purchase of the Shafter mine, at the Tower House, by W. T. Coleman, marks a new era in the history of that valuable property. The price paid for the property was $16,000. Shafter has already taken out a fortune and the mine is not yet fairly opened. The ore is free milling and easily worked.

Sierra.

QUARTZ AT POKER FLAT.—Sierra *Tribune*, Dec. 26: About one-quarter mile north-east of Poker Flat, P. R. Gardnier, with his son and four others, are operating on a quartz ledge that bears every indication of proving a permanent and paying piece of mining property. The parties struck the first prospect in the vein last Thanksgiving day. Since that time they have run 12 ft through the pay-chute and taken out about 50 tons of ore, which is now on the dump. The ledge varies from three to four ft in thickness. They have also run a tunnel 80 ft lower down the hill and encountered the vein at a distance of 50 ft from the surface. Gold can be obtained in the ledge at the latter point. Mr. Gardnier arrived in town Tuesday, and called at this office. He left a piece of rock with us that was picked up on the dump. If he had given us a ton of the same sort we would be worth $20,000 more than we are at present. That gentleman's chief business here was to secure one of those patent quartz crushers manufactured at the Downieville foundry. The mill was purchased, but the storm prevented its being shipped. It is not probable that the crusher can be packed into the mine now this winter, as we understand that about eighteen inches of snow had fallen on the mountain up to Wednesday. It is to be regretted that the mill could not have been got in there this season as the parties would then have realized some profits while pushing ahead developments in their mine. However, our friends have no reason to feel discouraged, even at such a drawback, and the gold will be worth just as much another season, at all events.

SIERRA CITY.—Truckee *Republican*, Dec. 20: On Monday evening Mr. A. W. Bishop and Herbert Winter, the latter recently from the East, passed through Truckee from Sierra City on their way to Oakland, where the former, Mr. Bishop, resides. From him we learned that the celebrated Marguerite mine, two miles below Sierra City, will have its mammoth machinery all in readiness and start up next Saturday, when we may expect to hear some good news from that truly excellent mine. It is located about seven miles north or northerly from Sierra City, between Butcher ranch and Hog canyon, and about five miles south or southerly, and on the same range with that truly famous Four Hills mine in Sierra county.

SIERRA CITY.—*Mountain Messenger*, Dec. 27: The Colombo contractors are running the lower level as fast as powder and muscle will permit, for the lode which had been displaced in the front by some fault. At the Marguerite mine, Supt. Myer has been hard at work day and night almost, with a gang of men, to keep the tailings that came down the river, out of the mill flume, and we are sorry to say, that when the freshet was at its height, the water tore away five or six boxes, but with Mr. Meyer's great energy, the damage was repaired the next day, and the mill running again. Mr. Chas. Hendel was surveying during the storm, in that mine, to connect the 4th with the 3d level, through their new three compartment shaft, and the workmen are now busy raising up on the lode. Mr. P. A. Humbert, the Consulting Engineer, who designed and patented the hoisting and pumping apparatus by wire rope, has completed everything, and a few days ago the machinery was set in motion by his brother, Arthur, everything working to their entire satisfaction after a few trials. By this way of working their mine, the Company will save from 8 to 9 cords of wood per day. They expect in a few days to have their hoisting machinery on said new shaft, all completed. The sinking pump now placed on the third level, is a double-acting plunger, invented by Mr. Humbert, and will be doing its duty until the new shaft is completed to the 4th level, where the 11,000-lb. station pump will be placed, and from where the station pump will be advanced as the shaft progresses in depth. It is expected that with this new machinery, that the mine can be worked to at least 1,500 to 2,000 feet. The Company's mill of 20 stamps, is steadily crushing the rich rock from the mine, yielding handsome gold bars. It is rumored that Mr. Berger, the former Supt. of the mine, who lately found a good-sized, rich quartz ledge, is about to visit his relatives in New York. He recently had his mines surveyed by Messrs. Davis and Hendel, and proposes with his nephew, Mr. Winters, to work the mines as soon as the snow will permit. Their claims are supposed to be an extension of the well-known Young America mine, owned by Messrs. Busch, Deidesheimer, Sunderhause and Huges, and are located near Packer Lake. The Young America Company are working four men, driving their lower tunnel along the rich prospecting lode towards the summit, between Packer and Sardine Lakes, and will have their mine well opened by next spring, so as to have enough quartz developed to run their proposed mill. The Mountain lode, owned by Mr. H. Warner, on the same quartz belt as the Young America, shows rich rock and will be largely developed next spring by its owner. The Beard brothers intend to extend their lower tunnel on the celebrated Phœnix mine, near the Sierra Buttes, toward their rich lode, which, when properly opened, will give employment to a great many men. The Sierra Buttes Company are steadily driving their No. 9 tunnel on the lode towards the pay chimney.

RICH DISCOVERY.—*Greenville Bulletin*, Dec. 27: From Mr. J. P. Hall, who has just returned from Sierra county, we have the following: Cannon Creek and the other creeks which empty into it not far above Poker Flat, Sierra county, have been exceedingly rich, and some of the points which have been hydraulicked off, have been very rich in quartz gold. Although quite a number of ledges cropped out in the vicinity, for many years they were hardly noticed by the miner, as, with pick and pan, he traveled up and down, looking for sluice or hydraulic diggings. From one of the ledges, however, 18 or 20 years ago, rocks had been crushed with an arastra, but was supposed to have given out, since which time, it has been located by different parties, who did little or no work on it, and then gave it up. The present owners located it more to keep other parties from doing so, and from interrupting with their gravel claims. Last Thanksgiving day, one of the partners discovered gold in the rock where their ditch crossed the ledge. A tunnel was started, and when Mr. Hall was there, it was in about twelve feet on the ledge, but so near the surface, that the ledge was considerably crushed. It is about 4 feet in width. Near the center, he saw rock taken out, which, when crushed in a mortar, yielded ten dollars to the pound. The gold is what Mr. Hall calls foliage gold, of which he showed a sample of nearly one-half an ounce in weight, the pieces having been taken out of less than a pound of rock. They are in the shape of branches, twigs, leaves, and a piece can be seen at this office almost a fac simile of a fern. The name of the mine is the Belmont Consolidated, and the discovery is on the point between Smid Horse and Illinois canons. The owners are P. R. Gardner and son, Mike Bowers, Mat Burth, Fred Hammond and Jacob Haas, nearly all of whom are old miners in that vicinity, and well known in Sierra county. We also learn from Mr. Hall, that a week ago last Saturday, a very rich boulder was found in the Redding mine, near Whiskey Diggings, Sierra county, owned by Mr. J. P. Denoon. The boulder was at least five feet from the bed-rock, and the gold was discovered while breaking off a point to make room for the timbers. The rock is twenty-two inches long by fourteen inches wide, and about a foot thick.

Trinity.

DON'T GO NOW.—Trinity *Journal*, Dec. 27: It is only right and human that we should caution prospectors against going to New River at the present time. No prospecting can be done there now; no work can be obtained as the mines now working have all the laborers they require; there are no extra provisions in the district, and we learn barely enough to winter the men now there. Wait until next spring when the snow is gone and all conditions favorable for roughing it and prospecting the rich extent of territory between the East Fork of North Fork and the head of New River.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, Dec. 27: The west crosscut on the 2800 is out 66 feet. The face is in a solid body of quartz giving low assays. At a distance of 45 feet from the main north drift this crosscut passed through about three feet of very fine ore—ore assaying from $50 to over $600 a ton. Then west of this it cut an eight-foot streak averaging $12.25 a ton. It is probable that the quartz now being passed through will make another body of ore out near the west wall. A west drift to connect with the bottom of the winze at the 3000 level has been started from the Combination shaft, and is now out 30 feet. The ground is hard but blasts well, and they are able to make 12 feet per day in the drift. As soon as the hydraulic pump starts up the Norcross folks will begin a west crosscut on the 2700 level, at which point a working station has already been opened.

SAVAGE.—The E-street tunnel is in a distance of 620 feet. It has about 50 feet to go to reach the point where it will encounter the northern continuation of the ore body that was worked in the Hale and Norcross. They have recently been passing through a very heavy body of clay (doubtless the east clay of the vein) which, from its swellings, has given much trouble, but are now in a more solid formation. This formation is vein material—a mixture of quartz, clay and porphyry—which presents a very favorable appearance.

COMBINATION SHAFT.—The new hydraulic pump at the 3000 level is set up and ready to run. All now lacking is the pieces of pipe with which to make the connection at the 2600 level. On the 3000 level a west drift has been started to connect with the bottom of the Hale and Norcross winze.

UNION CON.—Good headway is making in the work of cleaning out and repairing the south drifts on the 2300 and 2700 levels. The joint Sierra Nevada east drift on the 2300 level is also being reopened and repaired. As the water rises in the lower levels it forces up to the levels above great quantities of foul-smelling air and gases; however, this bad air is not of a dangerous character, though very disagreeable.

ALPHA.—The drifts on the 600 and 900 levels still continue to pass through solid quartz containing many streaks and bunches of ore. The assays run from $5 or $6 to as high as $60, but no workable body of ore has yet been encountered. The body of quartz is over 100 feet in width and is of a very favorable appearance.

OPHIR.—The west drift on the 500 is now into the ledge of the old workings, and the water is fast draining out. On the 1500 level a winze is being sunk at the end of the west cross-cut from the main south drift to connect with the northwest drift on the 1750 level of the Con. California and Virginia.

CON. CALIFORNIA AND VIRGINIA.—The northwest drift on the 1750 level has at last reached the old workings to the northward of where the fire broke out in the old timbers some years ago, and they are now taking out a considerable amount of ore that will pay for milling.

BEST AND BELCHER.—The west crosscut on the 825 level at the Gould and Curry north line is still in vein material of a very promising appearance. It has yet a long distance to go to reach the west wall. Some of the feeders of quartz encountered give low assays.

ALTA.—Good headway is making in the new east cross-cut on the 1350 level. It is in quartz that promises well. The water is about 30 feet above the 1500 level and is still rising, but very slowly.

GOULD AND CURRY.—On the 825 level the west

cross-cut at the Savage north line is still finding occasional streaks of quartz that give low assays. A large area of ground remains to be explored.

SCORPION.—The north drift from the main west crosscut, on the 500 level, is out about 400 feet. It is still in vein material of a promising appearance. There is no trouble from water.

YELLOW JACKET.—Sufficient low-grade ore is still being obtained from the old upper levels to keep the mills on the Carson river running to their full capacity.

OVERMAN.—Sufficient low-grade ore is being found in the old upper levels to keep a small force of miners employed. About 60 tons of ore a day are being taken out.

ANDES.—The gases from the fire in the old Central tunnel have about disappeared, and the men will be put back into the mine in two or three days.

UTAH.—In accordance with orders from below, work in the mine has been discontinued, there being at present a lack of funds.

BELCHER.—About the usual amount of low-grade ore is being extracted and sent to the mills on the Carson river.

CROWN POINT.—About the usual quantity and quality of ore is being extracted and sent to the mills.

SIERRA NEVADA.—On the 2500 level are reopening and repairing the east drift joint with the Union Con.

Columbus District.

MOUNT DIABLO.—Candelaria *True Fissure*, Dec. 27: The north cross-cut on the sixth level is now in 79 feet, and a west drift has been started from the station on this level. The west drift on the fifth level has advanced 11 feet, and has shown a foot of $75 ore during the week, while the raise near the face of this drift shows several streaks of ore. On this level, near the foot of winze No. 1, there is a strong ledge showing, but the ore is low-grade. The west drift on the fourth level has advanced 11 feet and shows nothing of value. A small amount of ore is being stoped from between the third and fourth levels both east and west of the shaft. Between the second and third levels, west of the shaft, considerable $70 ore is being taken from a ledge that averages 18 inches wide. East of the shaft, between the same levels, a small amount of high grade ore is being stoped. The intermediate, between the first and second levels, is given some good ore, and a small amount of ore is being taken from the first level.

Eureka District.

THE BOWMAN MINE.—*Sentinel*, Dec. 26: John McAulay, Supt, of the Bowman mine, returned from quite an extensive trip through the East, even to "down in Maine," yesterday morning. One of Mr. McAulay's objects in going East was to confer with the company he represents, their office being in Boston, concerning the present and future workings of the Bowman. After making a statement of the present condition of matters and of the prospects of the future in case deeper exploration in their property is made, the company expressed a decided faith in the worth and future of this district, but said they did not feel themselves justified in making large outlays until the general cost of mining is cheapened. They did, however, arrange with Mr. McAulay to have their shaft sunk 300 feet deeper, which work will be commenced about the 1st of January or as soon as a shipment of cable arrives from the East.

Jumbo District.

LARGE VEIN.—*Silver State*, Dec. 26: A prospector known as "Mormon Dan," is reported as having discovered a large vein of ore in the Jumbo district, some four miles from Ike West's ranch. This district, which was discovered by Dave Buel, is situated about 35 miles due west from Winnemucca.

Lewis District.

ANOTHER MILL.—Battle Mountain *Messenger*, Dec. 24: G. W. Bothwell has purchased J. T. Caldwell's interest in the Pittsburg Con. mine at Lewis, and will immediately build another mill of the same pattern as the one recently put up by that Company. He will also put new hoisting works on the morning Star mine, and proceed at once to take out ore. Mr. Bothwell is a "rustler," and through his efforts Lewis will doubtless come to the front again as a bullion producing camp.

Silver Park District.

TO BE WORKED AGAIN.—Southern Utah *Times*, Dec. 26: Silver Park mining district lies about 65 miles west of Frisco in Lincoln county, Nevada. About 15 years ago this was one of the liveliest camps in Eastern Nevada. A great number of locations were made and enough ore was extracted from the different claims to induce California capitalists to erect a ten-stamp mill for its reduction. Everything indicated at that time that Silver Park was about to become a great camp. Then came the White Pine excitement, and the glowing stories that were circulated throughout Nevada and California of the fabulously rich strikes made in this district, reached the miners at Silver Park. The prospectors caught the fever, pick and drill were cast aside, claims were abandoned and a stampede was started for the new El Dorado. At the time of the exodus from Silver Park, the deepest shaft was not down 50 feet from the surface. Among the first discoverers of this camp was Felix Knight. He had immense faith in its future and stayed with it. For 15 years he has lived there and worked his claims, the greater part of which time he was the sole inhabitant of the camp. His mines improved as a greater depth was reached, the ore became richer in quality, and the ledge proved to be regular and well defined. Mr. Knight was well aware that he possessed a bonanza, and for several years past he has worked to develop his property. Whenever he desired to raise a few thousand dollars, he would go to work and stope out a few tons of rich ore and ship it to the reduction mills at Pioche, or to the smelters at Salt Lake City. Some time during last summer, Mr. John Epply, of Salt Lake, hearing of the property, went out to Silver Park and managed to secure a bond on the mines from Mr. Knight. Mr. Knight passed through here during the first part of the week, on his way to Salt Lake City, where a sale of the property to a syndicate of Eastern capitalists will be finally consummated. We understand that Mr. Knight will realize some $150,000 out of the sale. The property consists of three patented claims, which take in 2,200 feet of the ledge. The ledge is a contact between quartzite and granite. There has been three shafts sunk on the ledge about 400 feet apart, being 100, 250 and 238 feet respectively in depth. The shafts are inclines, having been sunk in the ledge matter. The ore has been exposed from the top to the bottom in each of the shafts, Mr. Knight having followed the ore when prospecting his property, and drifts have been run east and west on the ledge from the shafts at different places. At the bottom of the 250 foot shaft on the Sam Tilden, a drift has been run for a distance of 300 feet. The ledge is eight feet in width, through which runs four feet of clean ore, which samples 245 ounces silver to the ton. The ore is quartz bearing horn and native silver. We have seen specimens taken from the mines which will assay over 1,000 ounces. Mr. Knight has made shipments from the mines which sampled over 1,000 ounces to the ton. Barney Mulhall, who came in with Mr. Knight, says that the company has leased the old mill which will be repaired and put in running order in a short time. There is between $12,000 and $15,000 worth of ore on the dump, and several hundred tons exposed in the different workings of the mine ready to be stoped out. Active operations will be started as soon as the mill is in proper working order, which will be soon after the 1st of January, 1885. Silver Park has all the natural facilities requisite for a prosperous mining camp. There is any quantity of wood and water, and, what is more desirable, an abundance of mineral. The ore is free milling and rich in silver, so that the camp will not be handicapped with the low price of lead, and the uncertainties arising from the tariff question, which are interfering to so great an extent, with the prosperity of base bullion mining districts at the present time.

Sprucemont District.

ORE.—Cor. Eureka *Sentinel*, Dec. 30: I was not heedless of what I saw. I know that I saw immense bodies of ore, the capacity or solid dimensions of which have been estimated by actual measurements. They exceed in extent and assay value the most favorable showing ever made in any mine on Ruby Hill or Eureka district. The class of ore is very much like the Eureka ore, but the ledge, so called, seems to be more definitely placed, which fact, in my judgment, adds strength to the permanency of the lode.

ARIZONA.

MINING NOTES.—Prescott *Courier*, Dec. 26: Mr. John Ensign, who has just come up from Hunibug district, says his pack train is kept busy moving ore. All chloriders in the district are making money. Mr. Cover, superintendent of the St. Louis Company, has gone back to the mill. Snow is very deep in Bradshaw district. Miners will lose some of their animals. Mr. Thomas S. Livermore, from Swansea, Wales, has come to Arizona, to examine copper properties. A new district has been formed in Yuma county. It is about 30 miles east of Castle Dome. Hugh Tighe, who has just come in from the head of Hassayampa, says that A. J. Head recently discovered a ledge containing silver, which shows well. Mr. Tighe, like all miners who have examined Dave Grubb's mines, believes them to be as good as the county can boast of. J. T. Weber has returned from doing assessment work on the Compton and Poorman mines. The former belongs to Messrs. Sines and Kirwagen; the latter to Jas. Guild. Ore taken out is very rich in silver.

PIMA COUNTY COPPER.—*Sunshine and Silver*, Dec. 26: The Sierrita copper mines are a group of about 30 mines, situated 30 miles south of Tucson. The result of two weeks' work on the Sadie, one of the claims, by one man is a ton and a half of ore, that goes 50 per cent in copper. Ore is now being taken out for shipment. The principal owner of the mines is Geo. H. Spears, of Tucson. This property is said to make an equally good showing, for the development done, to any copper mines in the Territory.

GOLD HILL ITEMS.—*Silver Belt*, Dec. 29: Gold Hill and Lost Gulch district, although little known, is one of the richest mineral sections of Gila county. It is distinctively a gold district and possesses several very promising claims which are now being developed. The Genevieve and Manzanita owned by Messrs. Webster and Winne, are developing finely. Mr. Winne, who is now at work on these claims, is taking out good ore. The vein in the Manzanita is said to be from three to four feet wide, and assays well. Mr. Winne also owns the old Munson claim, from which he is getting rich rock. W. V. Kingsbury is doing assessment work on the Eureka, in Lost Gulch, which is also a gold bearing claim and has produced considerable rich ore. Ed. Lidolph is taking out ore from the Golden Eagle, which he intends soon to have worked. The last ore milled, from this property, yielded a average of $50 per ton. This district is destined to attract considerable attention in the future.

SALE OF A QUIJOTOA MINE.—Globe *Chronicle*, Dec. 26: Gen. A. A. McDonell, a resident of Los Angeles county, Cal., and the principal owner of the Buffalo mine, of Globe district, who is on a visit here in the interest of the Mineral Belt railroad says, that he is conversant with the facts concerning the following sale of a Quijotoa mine. "Robert Martin traded a one-quarter undivided interest in the Palo Verde mine, Quijotoa mountains, Arizona, for 80 acres of valuable land at Ontario, Ontario colony. As no land at Ontario can be purchased for less than $150 per acre, this sale of the mine is based on a cash value of $50,000. H. B. Botsford is the new partner in the Palo Verde, and is well satisfied with trade. Mr. Martin is negotiating for a cash sale of the Jersey Lily mine in the same district to a stock company here. General McDonell says that last year he purchased a tract of land in the same vicinity at $100 per acre, and he would not sell it now for $150.

COLORADO.

OUR DOTS FROM DUMONT.—Colorado *Miner*, Dec. 20th: The storm of the past week makes one believe that winter has indeed come. Notwithstanding the heavy fall of snow, the activity among mines of Crystal mountain remains unabated. The Dew Drop grows better every foot that is driven. Level No. 1, run from the bottom of the main shaft, is now over 30 feet in length, and is being pushed ahead at the rate of about three feet per day. There is a very perceptible improvement in the quantity of the ore now being extracted. The pay crevice has widened considerably since our last report. The shaft house is nearing completion rapidly, and will be ready for occupancy in a few days. Colonel Irvine, the lucky owner, informs your correspondent that a large shipment of the first and second class mineral will shortly be made. The Colonel has a number of other claims in the vicinity of the Dew Drop which promise well. The miners throughout the district are working hard to place these mines in condition for shipping large quantities of ore. Everything betokens a prosperous and successful season for our "treasure vaults."

Elk Mountain Pilot, Dec. 25: A section of coal land this side of the A. M. C. Co's breaker, belonging to Frank Chapin, J. B. Thompson and Ricketts & Barnes, was sold a few days ago to a syndicate of capitalists and railroad men living in Ohio and Michigan. The consideration is not made known to the public. Mr. E. E. Dwight, of Detroit, Michigan, representing the syndicate, was here about three weeks ago, and on inspecting the land, closed the sale immediately. We understand that the syndicate being composed of railroad men, they entered into an arrangement with the D. & R. G. R. R. to carry their coal at a rate that was satisfactory to all parties. Alexander boys are in town, from Poverty gulch. They will work the Hawkeye mine all winter. Assessment work is being done on the Terrible on the south slope of Sheep mountain, which shows a large vein carrying brittle silver, copper and iron. The Forrest Queen, Great Eastern, Bullion King and Ruby Chief are the only mines that are doing any amount of work in Irwin this winter. The Great Eastern is taking out some very good mineral at present. In the Forest Queen they are taking out ore between the surface and tunnel level and running the concentrator with it.

IDAHO.

YANKEE FORK.—*Ketchum Keystone*, Dec. 25: Last Spring, in digging a ditch from Paradise gulch to bring water on the ridge back of Mr. Morrison's house for the purpose of washing a gravel knoll, very rich gold and silver float was thrown out. In washing the gravel bank, a good many large nuggets were found, ranging from one-half to five ounces in weight, and many large pieces of quartz with gold, were found. After the placer season was over, Mr. Morrison turned his attention to the source from where the quartz and nuggets came. Starting a cut at the head of the bar he soon broke into a quartz vein, similar to that of the south vein of the Dickens, but richer than the Dickens. The ledge is a couple feet wide, and the rich ore vein about eight inches. The quartz in sight is rich in gold and silver—the gold in wires and nuggets, and the silver in masses of sulphurets. It is believed that with a hand mortar one man could pound out a thousand dollars a day. He has one piece of 30 pounds that is literally full of gold. He was offered $1,000 for the privilege of knocking out one piece of ore in the face of the drift, but refused it. Just two years ago today I sat out in a snow storm nearly all day making a sketch of the same ground for parties who had in view the purchase of the property. It was bonded then, but the bond was allowed to expire. Since then Mr. Morrison has tried hard to sell the ground, but to no purpose. Now parties are after it, and if they get it they will pay for it. This new strike of Morrison's adds value to the Dickens, as it is on the same vein, but on the west side of Jordan from the Dickens. The vein can be traced from one hill to the other. There have been two or three discoveries between here and Custer, in the vicinity of the Dickens mine, some of the ore assaying as high as 240 ounces per ton.

TERRITORIAL NOTES.—*Ketchum Keystone*, Dec. 24: There are four men at work on the Muldoon mine, and in all there are 20 men in the camp. English capitalists are examining the Coeur d'Alene quartz ledges with a view to buying. Gen. Cunningham and others of Bellevue, are making good shipments of ore from the Deadshot, which they have under lease. An ore sampler is to be one of the new Bellevue enterprises. There is plenty of work for one there.

THE DEER TRAIL.—Idaho *Keystone*, Dec. 25: Frank Lemon, of the Deer Trail Mine, on the head of Warm Springs Creek, left the first of the week for a visit to his home in Indiana. He left with us a piece of Deer Trail ore weighing 104 pounds, for the New Orleans Exposition, before leaving. It samples nearly 250 ounces. The Deer Trail, with three men on ore, shipped nearly 50 tons to the Philadelphia smelters here during the fall, the average net yield of which was about $145 per ton. The ledge is two to three feet in width, and carries a low per cent of lead and high average of silver. Houses were built at the mine the past fall, and supplies laid in for the winter. Mr. J. W. Platt, partner of Frank, is at the mine with a force of men, taking out ore. The vein was recently struck in the main tunnel, which leaves a great deal of ore in sight. A few weeks since Messrs. Platt & Lemon could have taken $25,000 for the Deer Trail, but would not take $30,000 for it since the strike was made in the tunnel. That is the way the mining lottery goes. Last spring the Deer Trail owners were prospectors—to-day they are rich mine owners, with an abundance of ore in sight that samples from 140 to 280 ounces per ton. They will have much ore no ship next season. The mine is situated on the divide between Smoky and Warm Springs, and are a rich mineral belt.

SOME MINES OF IDAHO.—Idaho *Statesman*: Several Eastern journals allude to the Coeur d'Alene mines as worthless, and say that the excitement aroused by western papers and advertising bureaus in regard to the mineral deposits of that region, was bogus. These eastern periodicals are laboring under a serious misapprehension of the facts. The Coeur d'Alene country has disappointed no practical miners who went there properly equipped to withstand the rigors of that northern climate and get at the real resources of the place. To be sure, not every one who went there to seek a fortune has been successful, but the fact has been demonstrated beyond the possibility of a doubt, that the precious metals are there in abundance, and not a few paying claims have been found which have not only already yielded large quantities of gold, but promise even better results in the future. It is also alleged by some of our eastern contemporaries that the "Seven Devils" country, north of Weiser, which has recently attracted well merited attention as an unexplored region full of great promise to miners, it being advertised merely for the purpose of victimizing the public. Nothing could be more absurd. What possible object could any one have in creating false excitements of this kind? The facts are that this Seven Devils country, in spite of its bad name, is exceedingly rich in minerals. But it must not therefore be supposed that every one who goes there with the intention and expectation of making millions will be successful. In the best mining lands ever discovered some have been disappointed even where many have been successful in the highest degree. The Seven Devils country has not as yet been thoroughly prospected, but enough reliable information is at hand to warrant the assertion that fortunes will be made there in the near future.

OREGON.

WORKING.—Jacksonville *Times*, Dec. 22: Many of the miners have commenced to do a little work already. Gin Lin of Uniontown has a fair supply of water and is husy piping. The miners are generally well prepared and expect to make a better showing this season than they have for several past. Wimer & Sons are operating two pipes in their claims near Waldo, and other miners in Josephine county are also at work. The Southern Oregon Development Co. has 500 tons of low-grade ore ready to ship from this county to the reduction works in East Portland. The iron and copper mines of Jackson and Josephine counties are rich and extensive, and must sooner or later command the attention they deserve. Geo Schumpf informs us that some capitalists will soon arrive from Portland for the purpose of examining his quartz ledge in Willow Springs precinct. John Miller, who has one of the best hydraulic mines in Southern Oregon, has everything in shipshape for a big run and will commence work this week. Green Bros. of Galice creek, who have one of the best quartz ledges in the State, recently bonded it to parties from abroad for the sum of $20,000, we learn. The transfer of the property is expected to take place before long.

NOTES.—Jacksonville *Times*, Dec. 26: Miners are happy everywhere and anticipate largely on the future. Frank Smith will work Marshal Curtis' mines on Jackson creek this season. Greater activity than ever is noticeable in the mining districts of Southern and Southwestern Oregon. Wm. Bybee's mine near Waldo is running on full time, as also is Bybee & Hall's claim on Canyon creek. Keaton & Klippel of Poorman's creek are already favored with a fair supply of water and have their pipe in operation. The Sterling Mining Co. had everything in readiness when wet weather began and is piping with a full head of water. Miners in Josephine county are greatly encouraged and will make a good report. Some of the best mines in the State are located in that section. A considerable quantity of snow is already piled up in the mountains, which will come handy in the spring. No doubt plenty more will fall yet. Ingram & Dean of Willow Springs have commenced ground-sluicing. They recently purchased the mining claim formerly worked by the late John Ambrose. Jas. Eaton, who is now engaged in mining on Dividend Bar, in the big Applegate section, struck good prospects and has taken out a nice lot of gold, including a few nuggets of fair size. Piping has commenced at John Miller's extensive mining claim on Farmer's Flat, where great preparations have been made for the season's run. A good report may be expected from that mine. H. H. Magruder of Rock Point was in Jacksonville Tuesday, from whom we learned that many of the miners in that vicinity have sufficient water to commence operations, and that a good mining season is promised. To all appearances this will be the best mining season Southern Oregon has experienced for years. No wonder that the miners are in high spirits. Many thousands of dollars will be taken out if the stormy weather continues, and affords a good supply of water for the next few months. There would be quite a difference in the financial affairs of this and other vicinities in the event of a protracted wet season.

UTAH.

COPPER GULCH.—Southern Utah *Times*, Dec. 20th: Since the Comet and Cactus mines were closed last winter, Copper Gulch was practically abandoned. The Morrison Brothers, Charles and Loren, after a short visit to the East, returned to Frisco. Within the past few weeks they started on their own responsibility to prospect on the Comet ground, and with such success as to show that their theory of the situation of the ledge was the proper one. About 40 feet east of the new shaft and midway between the hoisting works and the discovery shaft, they started to sink on what they claimed was the ledge. They found ore on the surface, but in a very decomposed state, and mixed up with the country rock. They continued to sink, and the ore improved at every stroke of the pick. They are now down to a depth of 15 feet. The ore has become compact, and has widened out to the full width of the shaft, which is 4x5 feet. What the extent of this ore body is, can only be found out by prospectiug. The indications now are that they have struck a large chimney of ore. The clean ore assays 20 per cent copper and 120 ounces silver to the ton, and an average assay taken from the bottom gave a return of over 50 ounces silver and 10 per cent copper. This property should not be allowed to remain idle, and we have no doubt that if the managers of the Comet Company had a proper understanding of the value of their property, they would not hesitate a moment to begin active operations to develop the mine.

REVIEW.—Salt Lake *Tribune*, Dec. 26: The week has been a strange one since Saturday, and the trains have been much delayed, but no perceptible effort has been shown in the shipments of the metals. The shipments of ore and bullion from this city for the week ending Saturday, Dec. 29th, inclusive, were as follows: 56 cars bullion, 1,357,419 pounds; 40 cars ore, 1,145,550 pounds; 1 car lead, 20,000 pounds; total, 97 cars, 2,522,969 pounds. The receipts of bullion and ore in this city for the week ending Dec. 24th, inclusive, were: Bullion, $139,290.07; ore, $15,816; total, $155,106.07. The receipts the week previous were $153,560.13, of which $127,864.13 were bullion, and $25,696 ore. The output of the Horn Silver for the week was 17 cars of bullion, $42,500, bringing the total output for the year up to $2,759,000, which may prove to be slighly over the true figure. The product of the Ontario for the week was 69 bars of bullion, $44,155.74; total for the year, $1,658,795.28. The product of the Hanauer for the week was eight cars of bullion, of the value of $20,250. The Germania sent out during the week seven cars of bullion, $11,540.33.

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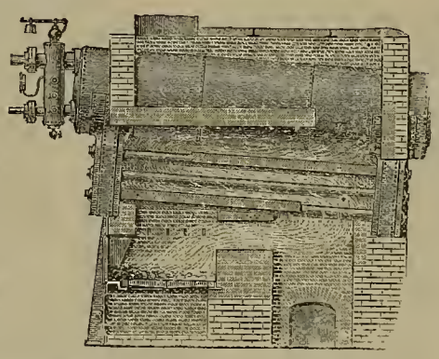

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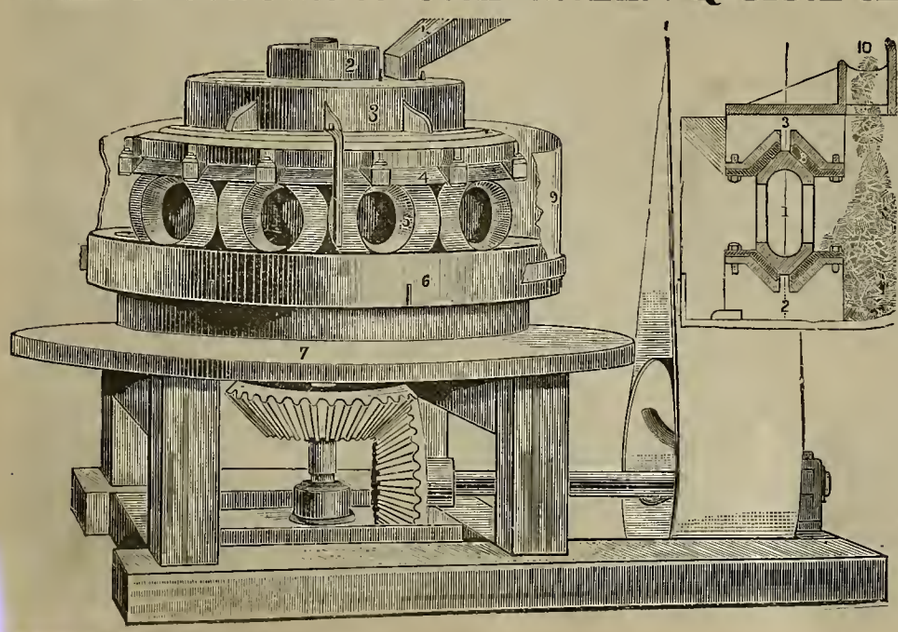

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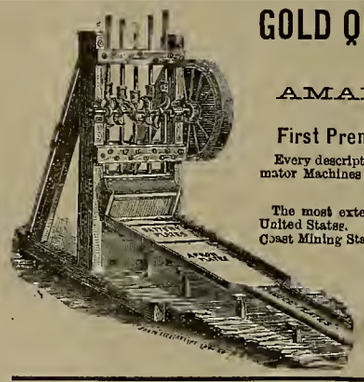

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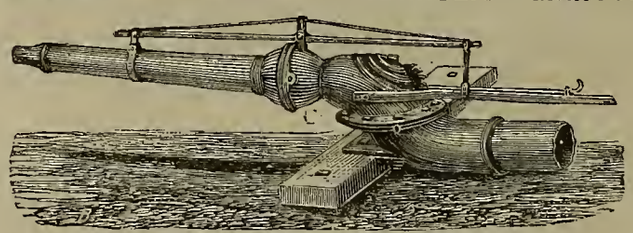

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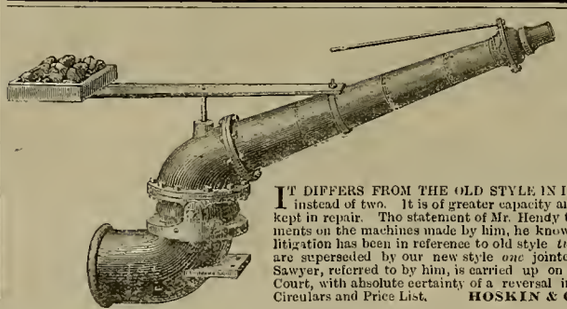

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Mining Share Market.

There is not much animation in the stock market. Attention is just now turned to the middle mines of the Comstock. The Virginia papers say they have found a 3-foot streak of very rich ore on the 2800 level of the Hale and Norcross. This ore assays from $50 to over $600 a ton. There is a chance for a bonanza between the 2800 and 3000 level. The ore streak is widest and richest in the bottom of the crosscut, showing that it is making downward; also there are indications that it is making to the northward. A drift has been started from the 3000 station of the combination shaft, to connect with the bottom of the Norcross winze. The new hydraulic pump will be working soon, when a crosscut will be commenced at the 2900 station of the Norcross.

At the Sierra Nevada, Union Consolidated and Mexican they are cleaning out and repairing drifts, preparatory to the resumption of explorations from the 2700 up to the 2300 level.

The leading Gold Hill mines continue to extract sufficient ore to keep the mills on the Carson river in full blast. The Overman is still taking out a considerable quantity of paying ore. At the Alta they are driving a crosscut to the east on the 1350 level. This crosscut is in quartz of a promising appearance.

Bullion Shipments.

Oro Grande, Dec. 26th, $4,212; Hanauer, 25, $5,200; Queen of the Hills, 25, $1,300; Germania, 25, $6,450; Horn Silver, 25, $10,000; Ontario, 25, $15,202; Christy, 25, $1,708; Germania, 27, $11,039; Ontario, 27, $9,556; Horn Silver, 27, $22,500; Christy, 27, $1,620; Horn Silver, 28, $10,000; Germania, 28, $3,485; Hanauer, 28, $2,700; Crescent, 28, $2,600; Queen of the Hills, 28, $1,450. The banks of Salt Lake City reported the receipt for the week ending December 24th, inclusive, of $139,290.07 in bullion and $15,816 in ore; an aggregate of $155,106.07

A NEW gold country has been found at Sandy Point, in the Straits of Magellan. That the alluvial deposits there are auriferous is well known, and there is every reason to believe that the precious metal is to be found distributed all over that part of the Chilean territory. Washing is carried on by the country people in the most primitive fashion, and without the use of quicksilver, and with these rough appliances they succeeded last year in extracting 15,000 grammes of gold, which was sold on the spot at 54 cents per gramme, representing $8,000. The yield for the current year is expected to be much more important. The gold is principally found in the rivers, as dust, and in nuggets.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JAREH C. HOAG—California.
J. J. BARTELL—Sacramento and San Joaquin Counties.
A. C. KNOX—Nevada (State).
GEO. MCDOWELL—Santa Clara County.
WM. PASCOE—San Francisco.
WM. H. COOK—Fresno County.
H. G. PARSONS—Nevada County.
G. W. INGALLS—Arizona.
W. WHITWELL—Oregon.
M. S. PRIME—Alameda County.

THE Pioche *Record* says: The prospectors are putting in their summer supply of water. They are piling the snow up high on the mountains and covering it with brush. They devoted most of the past week to gathering snow, and a number think they have a sufficient quantity to last until June or July, and they can afford to take a bath every other month.

THE LITHOGRAPHER AND PRINTER is one of the most useful and intelligently prepared trades' journal yet published in our country. Its issues have continually improved from the first. Subscription, $3 a year. Address Lithographer Publishing Co., Chicago. Fred. Bunring & Co. are proprietors.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCA	N. No.	AMT.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M and M Co	Alaska..	8..	50..	Dec 10..	Jan 11..	Jan 31..	T J Hay	306 Pine st
Alta S M Co	Nevada..	31..	25..	Dec 24..	Jan 9..	Jan 28..	W H Whatson	302 Montgomery st
Best & Belcher M Co	Nevada..	31..	50..	Nov 21..	Dec 30..	Jan 19..	W Willis	309 Montgomery st
Black Bear M Co	California	2..	25..	Dec 20..	Jan 26..	Feb 20..	W L Oliver	328 Montgomery st
Champion M Co	California	17..	10..	Nov 24..	Dec 29..	Jan 19..	T Wetzel	522 Montgomery st
Con Amador M Co	California	8..	30..	Dec 3..	Jan 5..	Jan 21..	F B Latham	408 California st
Copper Mt Con M Co	California	1..	05..	Dec 3..	Jan 13..	Feb 10..	A L Perkins	310 Pine st
Con Va & California M Co	Nevada..	1..	....	Nov 5..	Dec 13..	Jan 3..	A W Havens	309 Montgomery st
Eintracht Gravel M Co	California	17..	05..	Dec 9..	Feb 7..	Feb 16..	H Kunz	209 Sansome st
Excelsior M Co	California	9..	50..	Sept 2..	Dec 31..	Jan 22..	W J Stewart	215 Sansome st
Grand Prize M Co	Nevada..	17..	30..	Nov 24..	Dec 30..	Jan 28..	E M Hall	327 Pine st
Happy Valley Gravel M Co.	California	5..	03..	Dec 15..	Jan 21..	Feb 9..	D M Kent	330 Pine st
Hale & Norcross S M Co	Nevada..	83..	50..	Dec 8..	Jan 13..	Feb 3..	J F Lightner	309 Montgomery st
Indian Spring Drift M Co.	California	4..	05..	Nov 21..	Dec 22..	Jan 21..	A B Paul	328 Montgomery st
Lewis Con M Co	Arizona..	5..	03..	Nov 14..	Dec 22..	Jan 19..	J W Pew	310 Pine st
Mayflower Gravel M Co	California	27..	10..	Nov 20..	Dec 23..	Jan 12..	J Morizio	328 Montgomery st
Marshall M Co	California	2..	10..	Nov 6..	Dec 15..	Jan 5..	A L Perkins	310 Pine st
Mexican G M Co	Nevada..	28..	50..	Nov 11..	Dec 17..	Jan 8..	C E Elliott	309 Montgomery st
Ophir M Co	Nevada..	48..	50..	Nov 12..	Dec 17..	Jan 6..	E B Holmes	309 Montgomery st
Scorpion S M Co	Nevada..	19..	10..	Dec 1..	Jan 9..	Jan 13..	G R Spinney	310 Pine st
Summer Con M Co	California	2..	05..	Dec 18..	Jan 19..	Feb 12..	F E Lutz	330 Pine st
Silver Lining M Co	Nevada..	1..	07..	Dec 16..	Jan 24..	Feb 19..	J. Stadfeld	419 California st
Standard M Co	California	1..	25..	Oct 17..	Dec 1..	Jan 5..	W Willis	309 Montgomery st
Savage M Co	Nevada..	61..	50..	Nov 11..	Dec 15..	Jan 5..	E B Holmes	309 Montgomery st
Union Con M Co	Nevada..	28..	50..	Nov 5..	Dec 30..	Jan 19..	J M Buffington	309 California st
Utah S M Co	Nevada..	52..	50..	Dec 19..	Jan 26..	Feb 14..	G C Pratt	302 Montgomery st
Virginia Creek Gravel Co	California	1..	20..	Dec 20..	Jan 25..	Mar 2..	J M Quay	406 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Argenta M Co	Nevada..	E M Hall	327 Pine st	Annual	Jan 12
Head Center M Co	Arizona..	J W Pew	310 Pine st	Annual	Jan 9
Iowa M Co	California	C C Leavitt	510 Battery st	Annual	Jan 13
Mountain M Co	C	Herrmann	213 Mission st	Annual	Jan 5
Silver King M Co	Arizona..	J Nash	328 Montgomery st	Annual	Jan 13

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California..	B L Burling	328 Montgomery st	50	Dec 1
Coutention Con M Co	Arizona..	D C Bates	309 Montgomery st	25	Dec 15
Derbec Blue Gravel M Co	California..	T Wetzel	522 Montgomery st	10	Oct 8
Jackson M Co	California..	D C Bates	309 Montgomery st	10	Dec 27
Navajo M Co	Nevada..	J W Pew	310 Pine st	25	Dec 13
Paradise Valley M Co	Nevada..	W Letts Oliver	328 Montgomery st	10	Nov 28
Silver King M Co	Arizona..	J Nash	328 Montgomery st	25	Dec 15
Syndicate M Co	California..	J Stadfeldt	419 California st	10	Nov 6

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE. Dec 25-Dec 31	Portland. Rain.	Temp.	Wind.	Weather.	Red Bluff. Rain.	Temp.	Wind.	Weather.	Sacramento. Rain.	Temp.	Wind.	Weather.	S. Francisco. Rain.	Temp.	Wind.	Weather.	Los Angelee. Rain.	Temp.	Wind.	Weather.	San Diego. Rain.	Temp.	Wind.	Weather.
Thursday	.45	22	E	Cy.	.59	54	S	Cy.	1.44	55	S	Cy.	.70	59	SW	Cy.	1 64	55	SE	Cy.	.-	—	—	—
Friday	.35	28	—	L S.	.12	57	S	Fr.	.62	57	SW	Fr	.48	57	NW	Cy.	1.50	56	E	Cy.	1.30	60	W	Cy.
Saturday	.10	33	S	Cy.	.00	47	S	Fr.	.00	50	SE	Cl.	.00	52	E	C.	.01	60	S	Cl.	.04	61		Fr.
Sunday	.00	35	S	Cy.	.09	49	S	Fr.	.06	52	W	Fr.	.09	52	N	Fr.	.15	56	SE	Fr.	.49	60		Fr.
Monday	.00	26	N	Cl.	.00	42	N	Cl.	.00	43	NW	Cl	.00	46	NW	Cl.	.-	54	NW	Cl	.06	55		Cy.
Tuesday	.00	22	SE	Cl.	.00	38	N	Cy.	.00	40	N	Cy.	.-	43	NE	Cy.	.00	49	E	Cy.	.00	58	S	·
Wednesday	.01	19	SE	L S	.00	40	N	Fr.	.00	43	N	Cy.	.-	43	NE	Cy.	.00	56	E	Cl.	.00	58	W	Fr.
Totals	.91				.80				2.12				1.27				3.30				1 80			

EXPLANATION.—Cl. for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature and wind and weather at 11:58 A. M. (San Francisco mean time), with amount of rainfall in the preceding 24 hours

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Dec. 11.		WEEK ENDING Dec. 18.		WEEK ENDING Dec. 23.		WEEK ENDING Dec. 31.	
Alpha	.75	.80	.60	.70	....	....	....	.65
Alta	.20	.30	....	.20	....	.20	.10	.15
Andes	....	.20	....	.15	....	.15	.15	.20
Argenta	....	....	....	....	....	....	....	....
Belcher	....	.50	....	.30	....	....	....	.60
Belding	....	....	....	....	....	....	....	....
Best & Belcher	.80	1.15	.80	.85	.80	1.50	1.30	1.45
Bullion	.20	.30	....	....	....	.25	....	.25
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	.25	....	.20	.15	.20	....	.20
Bodie Con	2.10	2.70	1.80	2.10	1.95	2.00	1.90	2.10
Benton	....	.05	....	.05	....	.10	....	.10
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.30	.50	....	.30	....	....	.20	.50
California	.05	.35	.30	.35	.35	.40	.35	.40
Challenge	....	....	....	.10	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Chollar	2.40	2.75	2.40	2.60	2.50	2.75	2.40	2.70
Confidence	....	.65	....	.50	....	.75	....	.75
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.05	.35	.30	.35	.35	.40	.35	.40
Con. Pacific	.90	.95	1.05	1.10	....	1.10	....	1.10
Crown Point	.65	.75	.60	.75	....	....	....	....
Day	....	.75	....	.75	....	....	....	....
Eureka Con	2.40	2.50	....	2.40	....	....	1.25	1.80
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	.10	.15	.10	.15	....	.15	....	.15
Grand Prize	....	.10	....	....	....	....	....	....
Gould & Curry	1.00	1.20	1.05	1.15	1.10	1.25	1.10	1.30
Goodshaw	....	.05	....	.10	....	....	....	....
Hale & Norcross	2.50	3.00	2.55	2.85	2.80	4.15	3.65	4.10
Holmes	3.75	4.05	....	4.00	4.25	4.30	4.50	5.00
Independence	....	.15	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	....	.10	.10	.15	....	....	.15	.20
Martin White	....	....	....	....	....	....	.35	.40
Mono	1.00	2.20	.95	1.30	1.15	4.40	1.30	1.55
Mexican	.20	.45	.20	.75	.70	.73	.65	.75
Mt. Diablo	3.80	3.95	3.70	4.00	....	....	3.70	3.75
Northern Belle	....	....	....	....	....	....	....	....
Navajo	2.70	3.00	2.00	2.40	1.90	1.95	1.30	2.05
North Belle Isle	.20	.25	....	.25	....	....	....	.25
Occidental	....	1.00	.70	.80	....	.75	....	.75
Ophir	.20	.50	.15	.70	.65	.70	.65	.70
Overman	....	.10	....	....	....	....	....	....
Potosi	.85	1.10	.80	.90	.80	1.00	.80	1.00
Pinal Con	....	....	....	....	....	....	....	....
Savage	.70	1.00	.65	1.30	1.25	1.70	1.60	1.80
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	.70	1.10	.70	.75	.75	.85	.70	.80
Silver Hill	....	....	....	....	....	....	....	....
Silver King	5.50	5.75	....	....	....	....	....	....
Scorpion	....	.10	....	.05	....	.05	....	.10
Syndicate	.40	.45	....	....	....	.35	....	....
Tioga	....	....	....	....	....	....	....	....
Union Con	.30	.80	.60	.70	.65	.70	.55	.70
Utah	.60	.80	....	.50	.35	.45	.15	.40
Yellow Jacket	.70	1.10	.70	1.10	....	1.00	1.00	1.15
	....	....	....	....	....	....	....	....

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Jan. 1.

100 Alpha 80c
10 Andes 15c
10 Bodie Con 2.00
450 Benton Con 05c
250 B. & Belcher 1.30
230 Crown Point 75@80c
1270 Hale & Nor 3.55@3.60
180 Mexican 65c
100 Mono 1.50
400 Overman 10c
550 Potosi 75c
400 Sierra Nevada 65@70c
200 Savage 1.60
350 Scorpion 05c
100 Union Con 55c
400 Utah 20c
440 Yellow Jacket 1.50@1.60
50 Bodie 2.50
350 B. & Belcher 1.30@1.35
100 Belle Isle 15c
300 Bullion 25c
100 Chollar 2.15
368 Con Va & Cal 35c
50 Eureka Con 1.15
600 Gould & Curry 1.15
1290 Hale & Nor 3.60@3.75
800 Mono 1.55
100 Mexican 35c
1200 N. Belle Is 15@20c
110 Navajo 1.85@1.90
80 Ophir 65c
20 Occidental 75c
280 Potosi 75@85c
50 Scorpion 05c
150 Sierra Nevada 70c
820 Savage 1.65@1 70
25 Utah 10c
155 Union 63c
170 Yellow Jacket 1.30@1.55

AFTERNOON SESSION.

100 Alta 15c

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Jan. 1, 1885.

ANTIMONY—Per pound	— @	—
Hallet's	12½@	—
Cookson's	13½@	—
BORAX—Refined	7½@	8
IRON—Glengarnock ton	23 00 @	—
Eglinton, ton	22 00 @	—
American Soft, ton	27 00 @	—
Oregon Pig, ton	— @	—
Clipper Gap, Nos. 1 to 4	25 00 @	30 00
Clay Lane White	23 00 @	—
Shotts, No. 1	25 00 @	—
Refined Bar	3 @	3½
Boiler, 1 to 4	5 00 @	5 50
STEEL—English, lb	16 @	25
Black Diamond, ordinary sizes	13 @	—
Blister	15 @	—
Machinery	12 @	14
COPPER—		
Braziers' sizes	— @	25
Fire-box sheets	28 @	—
Bolt	23 @	25
Yellow Metal	24 @	—
LEAD—Pig	4 @	4½
Bar	5 @	—
Pipe	7 @	—
Sheet	8 @	—
Shot, discount 10% on 500 bag Drop, ₱ bag	1 85 @	—
Buck, ₱ bag	2 05 @	—
Chilled, do	2 25 @	—
TINPLATE—Oldcastle	5 26 @	6 00
Charcoal	6 50 @	6 75
Coke	5 25 @	5 50
Roofing	6 25 @	13 00
ZINC—German	9 @	10
Sheet, 7x3 ft, 7 to 10 lb, less the cask	8 @	10
QUICKSILVER—By the flask	35 00 @	—
Flasks, new	1 05 @	—
Flasks, old	85 @	—
NEW YORK PRICES—		
California Borax, refined	8½@	8¾
Pig Iron, American No. 1	18 00 @	19 00
Pig Iron, American No. 2	17 00 @	17 50
Quicksilver	48 @	50
Lead	3 62½@	—
Copper	11½@	—
Bar Silver	1 07½@	—

REPRESENTATIVES of the Transcontinental Association will meet in San Francisco on the 12th of January, and much speculation is rife as to the result of their labors.

Market Reports.

Lumber at Wholeeale.

The market has been moderately active, though receipts have been light of late. Quotations of cargo rates are as follows for redwood lumber, for delivery at San Francisco, Oakland, Alameda, Berkeley, Vallejo, Benicia, Port Costa, Martinez and Antioch:

ROUGH—No. 1 rough merchantable, $18; No. 2 (refuse) rough, $14; No. 1 rough boards (specified width, 10 inches and over), $19; No. 2 (refuse) do do do, $14; No. 1 rough lumber, surface one side, $21; No. 2 (refuse) do do do $18.

PICKETS—Rough square pickets, $12; rough pointed do, $14; fancy pointed do, $22.

HALF-INCH LUMBER—No. 1 ½-inch surfaced, board measure, $40; No. 2 do do do, $39; No. 3 do do do, $38; No. 4 (refuse) do do do, $32; No. 1 ½-inch battens, board measure, $40; No. 2 (refuse) do do do, $32; No. 1 ½-inch siding, 12 ft. and over, b m, $40; No. 2 (refuse) do do do $32; ½-inch siding, under 12 ft, $32.

RUSTIC—No. 1 Rustic, 1x10, 12 ft and over, $33; No. 2 do do do, $32; No. 3 do do do, $31; No. 4 Rustic, 1x10, $28; No. 5 (refuse) do do do, $21; No. 1 Rustic, 1x8, 12 ft and over, $31; No. 2 do do do, $30; No. 3 do do do, $29; No. 4 Rustic, 1x8, $26; No. 5 (refuse) do do, $21.

CLEAR—No. 1 surfaced and rough clear, $32; No. 2 do do do, $31; No. 3 do do do, $30; No. 4 (refuse) do do do, $24; No. 1 surfaced and rough clear, 1x8 and 1x6, $30; No. 2, do do do, $29; No. 3 do do do, $28; No. 4 (refuse) do do do, $24.

[Dimensioned, Surfaced and Rough Clear (widths and lengths), 12 inches wide and over, add $1 ₱ M (on each corresponding grade) to the above list price of "Clear."]

TONGUED AND GROOVED—No. 1 T and G, 1x4, 12 feet and over, $32; No. 2 (refuse) do do do, $24; No. 1 T and G, 1x6, 12 ft and over, $30; No. 2 (refuse) do do do, $24; T and G, 1x6, 7 to 11 ft, $26; do do, under 7 ft, $23.

TONGUED, GROOVED AND BEADED—No. 1 T, G and Beaded, 1x4, 1¼x4 and 1¼x6, 12 ft and over, $32; No. 2 (refuse) do do do, $24; T, G and Beaded, 1x4, 1¼x4 and 1¼x6, 7 to 11 ft, $27; do do, under 7 ft, $22.

ROUGH CLEAR—1x6 and under in width, and under 12 ft in length, $24.

[On a credit of 60 days, or a discount at the rate of 1 per cent per month for anticipated payments, and not less than 1 per cent per month added for extension of the same].

We quote cargo rates—Pine—Merchantable Rough, $15 ₱ M; Flooring, $24.20; Stepping, $37 ₱ M; Redwood—Merchantable Rough, $18; Surfaced, $32; Rough Clear, $32; Rustic, $33; Tongued and Grooved, $30; Tongued, Grooved and Beaded, $32.

Lumber at Retail.

Retail quotations for pine, fir and spruce are as follows:

ROUGH MERCHANTABLE—(Ordinary sizes) to 40 feet long, per M ft, $22.50; Rough Merchantable, 1x6, Fencing, $22.50; do do, 1x4, do, $23.50; do do, 1x3, do, $24.50; do do, 1x4, odd lengths, $22.50; do do, 1x6, do $21.60; do No. 2, all sizes, $18.50; do Selected, $26.50; do Clear, other than for T and G and Stepping, $31.

[Rough Clear for T and G and Stepping $1 ₱ M less than price of kind for which intended.]

Dressed T and G Flooring, 1x0, No. 1, vertical grain, ₱ M ft, $38.50; Dressed T and G Flooring, 1x6, No. 1, $33.50; do do do, No. 2, $28.50; Dressed T and G Flooring, 1x3, 1x4, 1¼x4 and over, No. 1, vertical grain, $40.50; do do do, No. 1, $35.50; do do do, No. 2, $29.50; Dressed Stepping, No. 1, vertical grain, $42.50; do do do, No. 1, $37.50; do do do, No. 2, $28.50.

SPRUCE—Rough Merchantable, ₱ M ft, $21.50; do Clear, $35; Clear Dressed (shelving), $40; Pickets (rough) board measure, $20.50; Furring, 1x2, per lineal ft, 1c; Laths, 1 and 1-½inch, ₱ M, $3.50; 1½-inch, $4.

[N. B.—For all sizes over 14 inches, and lengths over 40 feet, extra rates].

Retail quotations of Redwood are as follows:

ROUGH MERCHANTABLE—₱ M ft, $22.50; do Selected, $27.50; do No. 2, $18.50; Surface, No. 1 and Rough Clear, $40; do, 1x6, $37.50; do, No. 2, $30; Rustic, No. 1, 1x8, $37.50; do, No. 1, 1x10, $40; do, No. 2, $35; do, under 10ft, $35; T and G Redwood, 1x4, 1¼x4 and 1¼x6, $40; do do, 6-inch, 12 ft and over, $37.50; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; do do do, No. 2, $30; do do do, Beaded, 12 ft and over, $40; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; Half-inch Surface, $32.50; Pickets, Fancy, $30; do, Rough, pointed, $20; do do, square, $17.50; Siding, ½-inch, $27.50; Battens, ½-inch, per lineal ft, 1c; Shingles, ₱ M, $2.50; Shakes, Split, $11; do, Sawed, $12; Posts, per piece, 13c; Dressed Boards, ₱ M ft, $25.

On a credit of 60 days or less, or a discount of two (2) per cent for cash only. On all credits exceeding 60 days' time, not less than one (1) per cent per month to be added.

Under the rules of the Exchange, no "lump" sum will be given on any bill of lumber.

Nails.

We give the price list of the Pacific Iron and Nail Company.

FENCE AND BRAD.—10d to 60d, $2.75; 8d and 9d, $3.00; 6d and 7d, $2.25 4d and 5d, $3.50; 3d, $4.25; 2d, $5.50.

BARRELS.—2 inch, $6.75; 1¾ inch, $5.75; 1 inch, $5.25; 1¼ inch, $4.60; 1¼ inch, $4.25; 1½ inch, $3.75; 1½ inch, $3.50.

LINING.—¾ inch, $7.25; ⅝ inch, $8.75.

TOBACCO.—10d, $3.25 8d, $3.50; 6d to 7d, $3.75.

CLINCH.—6d to 30d, $4.50.

SLATING.—5d, $3.75; 4d, $3.75; 3d, $4.50; 2d, $5.75.

FINISHING.—2d, 1 inch, $8.75; 3d, 1¼ inch, $6.75; 4d, 1½ to 1¾ inch, $4.50; 6d, 2 inch, $4.25; 8d, 2½ inch, $4.00; 10d, 3 inch and over, $3.75.

CASING AND BOX.—10d to 30d, $3.50; 8d, $3.75; 6d, $8.00; 4d, $4.25; 3d, $5.25.

FINE BLUED.—4d, $4.50; 3d, $5.75; 2d, $6.50.

CUT SPIKES.—All sizes, $3.00.

BOAT SPIKES.—All sizes, $3.50.

Each half keg 10 cents extra.

TERMS.—Note or acceptance at 60 days with current rate of Exchange on S. F., or a discount of 2 per cent for cash, if remitted within 10 days from date of invoice.

All accounts when due subject to sight draft without notice.

An abatement of 10 cents per keg will be allowed upon orders of 200 kegs or over.

Building Material.

Lime, per barrel, $1.50@$1.60. Plaster, $2.75-3.00. Eastern Plaster, $3.00-3.25. Rosendale Cement, $2.25-2.75. Portland Cement, $3.50-3.75. Fire Brick, per 1,000, $40 @ $45, according to brand; hard, $10.00@$12,00; red, $8.00@$8.50; soft, $7.50; face, $30.00.

THE Plymouth Consolidated Gold Mining Company has just declared its nineteenth consecutive monthly dividend of $50,000, or $950,000 in all. This company is now running both its mills on full time—120 stamps. The entire machinery is run by water, which belongs to the company. The lowest level of the Plymouth is 1,300 feet down, and the ore chimney is 450 feet long by 35 feet wide. This mine is now the largest gold mine in North America, and paying more in dividends than any other. There are large bodies of ore uncovered, enough to keep the present mills occupied for several years. A new level is also to be opened during the coming months.

News in Brief.

TWENTY miles of wire on the California and Oregon Telegraph is down, doubled up by sleet.

GREAT excitement has been created in Georgia by the discovery of silver near Fort Mountain.

IT is said that never in the memory of any living man did Christmas close in England in deeper gloom.

THE municipal authorities of Paris have agreed to vote 60,000 francs toward the Grand Prix, which will be run in June next.

THE Great Eastern is still being prepared for sailing for New Orleans. Grave doubts are entertained as to whether she is seaworthy.

A COLORED man and woman of Newport have drawn $1,000 from a savings bank and gone to Canada, because of a fear that they were in danger of being re-slaved.

PROHIBITION is such an utter failure in Kansas that legislative action is expected very soon on the question. The liquor laws, as they stand now, are totally inoperative.

SEVERAL prominent business men of Pittsburg have decided to organize a stock corporation for the purpose of erecting and maintaining an exposition building in that city.

NEW YORK fashionables are reputed to have sent forth the edict that flowers are to be banished henceforth from society gatherings, operas and theaters, as well as funerals.

ON Christmas afternoon the electric light mast on the corner of Buena Vista and Short streets, Los Angeles, succumbed to the action of the continued rain, and fell with a crash.

THE raising of the age at which a child can be admitted into the public schools from five to six years, is being agitated in New York, and the introduction of a bill into the Assembly to that effect is talked of.

THE monument to Kit Carson, General Fremont's famous guide, is about completed, and will arrive at Santa Fe this week. It is understood that the inaugural ceremonies will take place on Decoration Day.

A PEARL weighing 93 karats, the largest known, and valued at $17,000, was found by an Indian diver at Mulege, Lower California, recently, and sold by him for $60 to a person who shipped it to London.

THE plea of a Nashville negro, convicted of butting an enemy almost fatally, was that in infancy he had been fed on milk from a notoriously belligerent goat. The Judge said he could not regard that fact as an extenuation.

THE Direct United States Cable Company and French Cable Company made a reduction in the cable tariff to Great Britain, Ireland and France to 20 cents per word. The reductiou was caused by the competition of the Mackey-Bennet Cable Company.

A SOUTHERN Pacific East-bound train was boarded on the 23d iost., near the Pecos river crossing, by a baud of druukeu cowboys, who amused themselves by firing their pistols through the car windows aud roof and otherwise intimidating the passengers.

DESPITE the arrest and expulsion from the Republic of certain Mormon missionaries who made themselves obnoxious to the authorities, the work of recruiting in the iuterest of the Utah religion continues with great activity in Switzerland.

BOTH of the Nevada Senators and Representative Cassidy are considerably annoyed in answering the questions put to them about the possible extinction of Nevada as one of the States of the Uniou, as tbe entire press of the East is seriously discussing the effect of a State being takeu out of the Union.

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A young Chemist, graduate of Germany, who speaks German, English and French, and who has worked at furnacer and in steel works in Belgium and England for several years, desires a similar position in this country. Highest references given. Address FELIX BECKER, ARLON, BELGIUM, EUROPE.

About Obtaining Patents.

Patents are Virtually Contracts

Between inventors and the public. The consideration flowing from both parties to the contract is expressly fixed by statute. The Government requires the following consideration in every case: First, that an applicant for a patent shall disclose a new and useful improvement, of which he is the first and original inventor. Second, that the invention has not been patented, or published in a printed publication prior to the date of his invention. Third, that the invention has not been in public use, or on sale, more than two years prior to his application for a patent. Fourth, that the invention shall be properly described and claimed in the specification forming a part of the patent. Provided an inventor complies strictly with these conditions, the Government guarantees that the inventor shall have the exclusive right to make, use and sell the thing invented for the term of seventeen years.

The Patent Law provides that in case a patent, which is the evidence of the contract, is not executed in compliance with the requirements of the law, it may be annulled and rendered void. Hence, it is of the greatest importance to every inventor that his patent or contract be skillfully and accurately drafted, that it may afford him complete protection for his invention during the life of his patent.

Secure a Good Patent.

An inventor should first ascertain whether or not his improvement has been patented to another. This requires an exhaustive search among all the patents in the class to which the invention relates. This question can often be answered gratuitously by us, immediately on receiving full information of the invention, by reason of our long and extensive practice as patent solicitors and editors and publishers of first-class, scientific and industrial journals, during the past 20 years and over. When the question of priority of invention is not so readily to be determined, it is generally best to make what is termed a "preliminary examination," by searching through the patent office reports among the patents in the class to which the invention relates, and referring to our extensive patent library, containing compilations of special classes of American and foreign inventions, mechanical dictionaries, scientific encyclopedias, files of scientific and mechanical newspapers, and an enormous number of patent applications by inventors of the Pacific coast, carefully filed by this office since 1860.

If, by this "preliminary examination," the improvement is found to have been previously invented, our client will receive, for the small sum of $5 for the examination, a verbal or written report showing definitely whereby his invention has been anticipated, thereby saving him further expense and perhaps much time, useless delay, anxiety, etc.

To avoid all unnecessary delay, however, in securing patente at the earliest moment practicable, inventors will do well to forward a model, drawing or sketch, with a plain, full and comprehensive description of their invention (stating distinctly what the particular points of improvement are), with $15 as a first installment of fees. If the improvement appears to us to be novel and patentable, the necessary papers for an application for a patent will be prepared immediately, and forwarded to the inventor for his signature. When the inventor receives the application and finds it duly prepared, he will carefully sign and return the same plainly addressed to us, with postal money order or express receipt for our own fee. The case will then be promptly filed by us in the Patent Office, and vigorously prosecuted to secure the best patent possible. (This course is the most expeditious and satisfactory, as no time is lost in transmitting correspondence relative to the preliminary stepe to be taken.) When the patent is allowed the inventor will be duly notified, and on sending the final Government fee of $20 to us, we will order the issue of the patent, and forward the same as soon as it is secured from the Patent Office.

The payments are thus divided and made easy. We make no pretence of doing cheap work, in order to entice custom, nor do we afterward make additional charges to bring the bill up to a fair compensation. We do our work honestly and thoroughly, and we never give a case up as long as there is a chance to obtain a patent. The Agency charge is from $25 to $30, or sometimes more, if the invention is intricate or complicated, or requires much labor. Drawings cost from $5 upward, according to their number and the time employed, and, if a model is sent, the express charges upon this and the papers must be added. The total cost, in addition to Government fees, rarely exceeds $40, and for this we do all we can without appealing the case.

When the invention consists of a new article of manufacture, or a new composition, samples of the separate ingredients sufficient to make the experiment, and also of the manufactured article itself, must be furnished.

Models and Drawings.

Models are now seldom required by the Commissioner of Patents, and generally only in intricate cases. Perfect drawings of practical working machines are considered more satisfactory to the Patent Office than the old and more cumbersome system of storing up an immense hulk of almost numberless models.

Drawings or sketches, sufficient to illustrate clearly the invention, with a sufficient description to enable us to make a full set of perfect drawings for the Patent Office is all that we require. A model will answer our purpose as well however, in cases where the inventor can more easily furnish it for our use.

The value and even the validity of a patent often depends on the character, clearness and sufficiency of its drawings. There are thousands of existing patents in which the improvements are but partially or very poorly illustrated in the drawings. When an attempt is made to dispose of such patents, the vagueness and defects of the drawings often prejudice capitalists and manufacturers against the invention while in reality it may be of great value, and would meet with ready sale had the invention been fully portrayed by artistic and skillfully executed drawings. Again, when patents of this character are brought into court, the uncertainty and ambiguity of the drawings enable the opposing experts to mystify the judges as to the construction or combination of parts intended to be covered by the patentee. In all cases prepared by us, the drawings are made under our personal supervision, by skilled draftsmen in our constant employ, and every precaution is taken that the invention is fully and clearly shown by different views, so that the improvement will be readily understood by the Examinere in the Patent Office, and comprehended by the public when the patent is granted.

In the Patent Office

The application is assigned to the Examiner having charge of the class to which the inventiou relates. The case must then take its turn with others in the order of filing, and in due time is carefully examined to test the novelty of the invention. If the examiner fails to find anything that anticipates the invention, a patent is immediately allowed, provided the specification and claims are drafted in proper form. Should the Examiner find a prior patent which, in his opinion, anticipates one or more of the claims in the application, a letter of rejection is sent to the attorney in charge of the case; and, if the attorney coincides with the views of the Examiner, the claims rejected are erased. In preparing applications for patents, an attorney should be careful to familiarize himself with the class of inventions to which the application pertains, so that the specification and claims may be drafted as nearly perfect in the first instance as is possible. This course saves much time in prosecuting the application to a patent.

When claims are improperly rejected on patents which do not anticipate the spirit or wording of the clems, proper steps are immediately taken to convince the Examiner of his error. This is done, in most part, by personal arguments, as the differences in construction, operation, function and results are more readily discovered and appreciated by an oral presentation of the facts than can possibly be done by relying solely on written arguments. In order that the Patent Office record of the patents shall be complete, an oral argument is generally supplemented by a manuscript brief, that others, in examining the files at any future timer may clearly comprehend the position taken by the Examiner and attorney in prosecuting the case to patent.

In addition to our own personal attention to the interest of our clients here, we have, for over 12 years past, had constantly in association with us in Washington, one of the soundest legal counselors and ablest of practitioners in patent business in this country, who carefully attends in person to our business at the Patent Office, and has attained success in a most marked degree.

Perfect Claims.

The value and force of a patent are dependent on its claims. A patent may disclose to the public the most important and valuable invention, and yet the claim be of such meager scope that the patent is actually worthless. When the claims of a patent are so loosely drafted that infringers can flood the market with improvements, differing from the improvement disclosed by the patent only in slight changes in construction and arrangements of parts, such a patent is valueless to the owner, as it fails to afford him that exclusive and complete protection guaranteed by the Patent Law. Hence it is that the greatest care, skill and perseverance are required, first, in properly drafting the claims in the first instance, and second, in prosecuting the application before the Patent Office, and maintaining the rights of the inventor to claims as broad and sweeping as the invention will warrant. This latter is no easy task. The Examiners of the Patent Office serve in the capacity of attorneys guarding the interests of the public. It is their sworn duty to exercise the greatest care and watchfulness, that patentees do not secure claims of greator scope than they are justly entitled to. It is but natural that Examiners are sometimes in error as to just what scope should be accredited an inveution. Although the Examiners act under honest convictions in cases where they refuse an inventor his just rights, yet it is the duty of the attorney to maintain the claims of his client, if he is convinced that they are just and proper. To succeed in this requires the display of tact, firmness and ability; and when the Examiner is made to see that the inventor is honestly and fairly entitled to the claims which have been rejected, he will almost invariably recede from his former action, and allow the case.

Advantages to Inventors on the Pacific Coast.

The firm of DEWEY & Co. (continuously editors and publishers of the MINING AND SCIENTIFIC PRESS, nearly from its early commencement in 1860) offer comparatively far better facilities to the local inventors of the Pacific States and Territories than are possessed by any other agents in America. Members of the firm give personal attention to the applications entrusted to their care. They have been longer in practice in patent soliciting than most agents who are still personally engaged in the business. They have secured more U. S. and foreign patents in the past 20 years (with very few exceptions) than any other firm still existing. Their practice has been so successful and long continued, that the great majority of inventions on this side of the American continent have been patented through their agency, thus affording them great and valuable experience, by thorough information of the true principles and points of novelty in the inventions, whether general in character or peculiarly local to this coast.

The extensive business combination and experience of this firm is undoubtedly one of the most fortunate in existence for affording inventors prompt and reliable advice, and the best possible facilities for securing their full patent rights with safety and dispatch at uniformly reasonable rates.

Every patentee of a worthy invention is guaranteed the gratuitous publication of a clearly stated and correct description of his invention, in one or more of our influential and reliable newspapers, affording just the circulation that is best calculated to widely inform the class of readers most especially interested in the subject of his invention.

Saving of Time, Etc.

Inventors on this coast will find that owing to our familiarity with inventions and local affairs of this coast, we can more readily and fully comprehend their wants, and thus save much of the time ordinarily consumed in preliminary writing back and forth when distant agencies are employed.

Caveats.

A Caveat is a confidential communication made to the Patent Office, and is therefore filed within its secret archives. The privilege secured under a caveat is, that it entitles the caveator to receive notice, for a period of one year, of any application for a patent subsequently filed, and which is adjudged to be novel, and is likely to interfere with the invention described in the caveat, and the caveator is then required to complete his application for a patent within three months from the date of said notice. Caveat papers should be very carefully prepared. Our fee for the service varies from $10 to $20. The Government fee is $10 additional.

To enable us to prepare caveat papers, we only require a sketch and description of the invention.

Rejected Applications.

Inventors who have rejected cases (prepared either by themselves, or for them by other agents), who desire to ascertain their prospects of success by further efforts, are invited to avail themselves of our unrivaled facilities for securing favorable results. We have been successful in securing Letters Patent in many previously abandoned cases. Our terms are always reasonable.

Inventors who do business with us will be notified of the state of their application in the Patent Office, when it is possible for us to do so.

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Patent Solicitors, Office of SCIENTIFIC PRESS, 252 Market St. Elevator entrance, No. 12 Front St., S. F.

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ASSESSMENT NOTICE

The Eureka Gas Company.—Location of principal place of business, San Francisco, Cal. Location of works, Eureka, Humboldt county, Cal.

NOTICE is hereby given that at a meeting of the Board of Directors, held on Wednesday the third day of December, 1884, an assessment (No. 1) of one dollar per share was levied on the capital stock of the corporation, payable immediately in United States gold coin to the Secretary at the office of the company, 302 Pine St., San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on Wednesday the fourteenth day of January, 1885, will be delinquent, and advertised for sale at public auction, and unless payment be made before, will be sold on Monday the second day of February, 1885, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

C. S. BACHELDER, Sec'y.
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DIVIDEND NOTICE.

San Francisco Savings Union,
532 California Street, cor. Webb.

For the half year ending with December 31, 1884, a dividend has been declared at the rate of four and thirty-two one-hundredths (4 32-100) per cent per annum on term deposits, and three and six-tenths (3 6-10) per cent per annum on ordinary deposits, free of taxes, payable on and after Friday, January 2, 1885.

LOVELL WHITE, Cashier.

DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half year ending December 31, 1884, the Board of Directors of the German Savings and Loan Society has declared a dividend on term deposits at the rate of four and thirty-two one-hundredths (4 32-100) per cent per annum, and on ordinary deposite at the rate of three and six tenths (3 6-10) per cent per annum, and payeble on and after the 2d day of January, 1885. By order

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OFFICE OF THE Plymouth Con. Gold Mining Co.,

No. 23 Nassau Street, Dec. 1, 1884.

DIVIDEND No. 10.

The Board of Trustees of this Company have this day declared the regular monthly dividend of fifty thousand dollars, being one per cent on the capital stock, or Fifty Cents per share, payable on the 5th inst.

W. VAN NORDEN, President.

ASSESSMENT NOTICE.

Fremont Mining and Milling Company.— Location of principal place of business, San Francisco, Cal. Location of works, Amador county, near Drytown, Cal.

NOTICE is hereby given that at a meeting of the Trustees, held on the twenty ninth day of December, 1884, an assessment (No. 1) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, No. 402 Front street, room 8, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the fourth day of February, 1885, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday the twenty-seventh day of February, 1885, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

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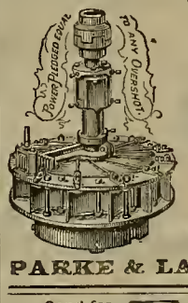

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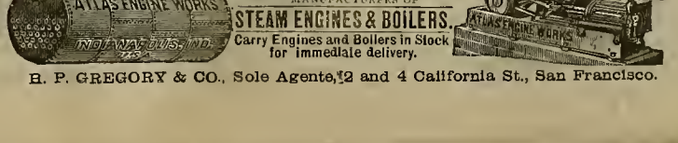

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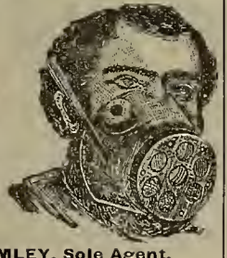
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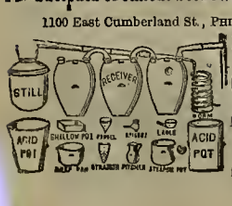

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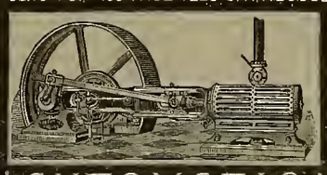
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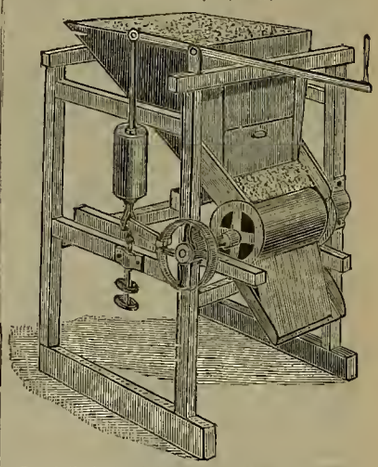
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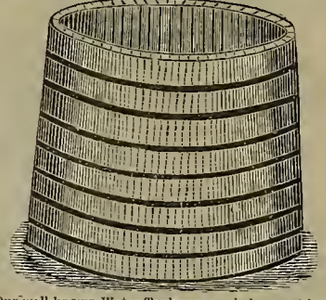
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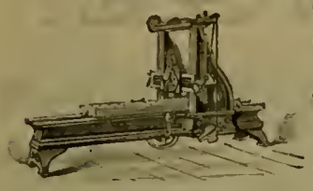

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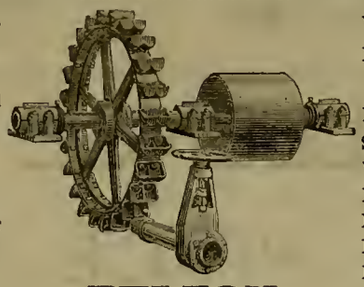

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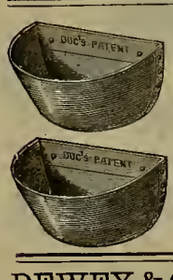

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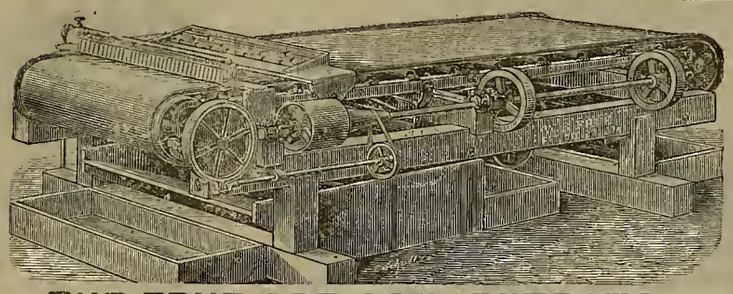

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The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement on patents owned by them.

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N. B.—We are and have been ready at any time to make a competitive trial against the Triumph, or any other Concentrator for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Co.,
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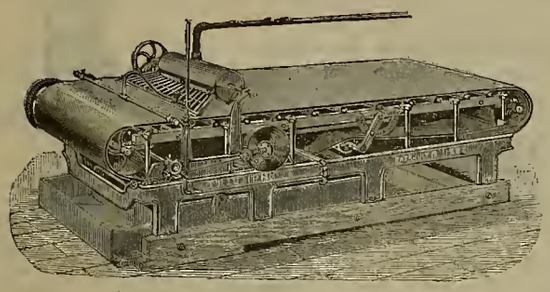

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These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with accurate deductions therefrom, will soon be published in Circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and **we hereby accept the Challenge of $1,000,** flaunted by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

We guarantee purchasers against all costs, expenses or charges incurred by reason of any infringements of any existing patents.

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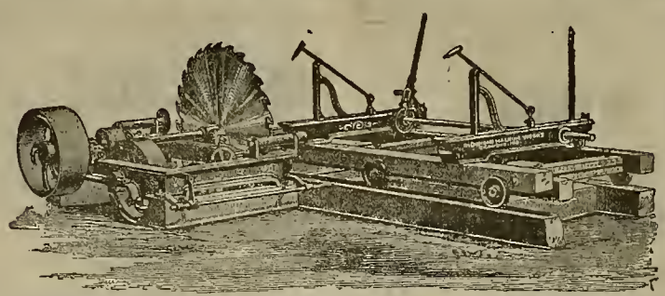

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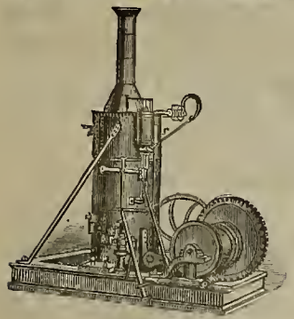

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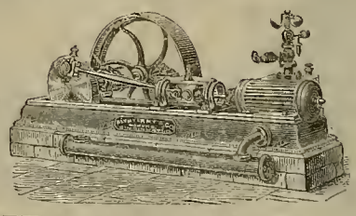

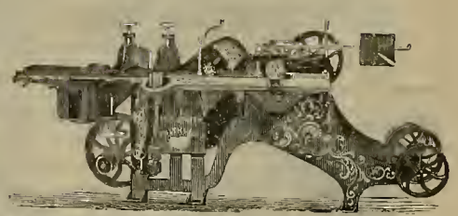

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JANUARY 10, 1885.

VOLUME XLXX. Number 2.

A Gas Assaying-Plant.

One of the characteristic steps in the march of modern scientific progress is the substitution of improved time-saving and labor-saving appliances for the antiquated and, in most cases, inconvenient forms of chemical and physical apparatus used by the earlier experimenters. This fact is strongly impressed upon us when we consider the question of the employment of illuminating-gas as a source of light, heat and power. Concerning its value as a light-producer, let the record of the past three-quarters of a century speak for itself. As a factor for power, we have evidence of its efficiency in the shape of the gas-engine. But its adaptability as a medium of heat, in a special direction, viz., the assaying of ores, is a feature to which Walter Lee Brown, of Chicago, Ill., recently called the attention of the American Institute of Mining Engineers, as follows:

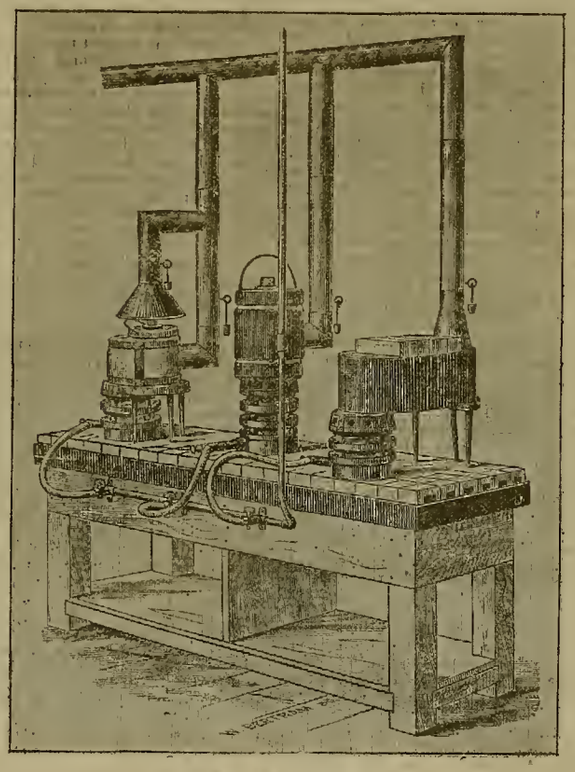
Gas assay-furnaces have been known and used for some years, but not to any very great extent, in this country at least. Therefore no apology on my part is required for the description I now give of a complete gas assaying-plant.

The illustration accompanying this is a faithful representation of the group, as it was designed by, and arranged for Mr. Brown, and appears in actual running order in his laboratory to-day. Its duty is to do roasting, crucible-fusion, scorification and cupellation. The furnace at the left is for roasting sulphurets or other ores for experimentation or actual work. It is what is known as a Fletcher No. 163, and consists of a fire-clay body strapped with sheet-iron bands and a burner (No. 16 Fletcher). The opening at the top (protected when not in use by the cover shown) permits the heat to have full play upon the roasting-dish placed upon it. The heat and flames pass from the burner through the furnace, and out and up the chimney-pipe. The funnel-shaped pipe on the cover is to catch and draw the fumes up the chimney. When the burner is lighted a powerful draught ensues, carrying all odors and fumes at once away. Both the pipe and hood are provided with dampers, controlled by small weights. The burner is connected to the gas-tray by stout ½-inch rubber tubing. A cast-iron tripod supports one end of the furnace and keeps everything firm.

Next in regular order (supposing a sulphuret ore to be under treatment) is the middle furnace, for crucible-fusions. This likewise consists of a furnace and burner. The latter is a Fletcher, No. 15, of the same construction, however, as the No. 16. The furnace proper is made in five parts—the central section (a cylinder of fire-clay); the bed-plate upon which it rests, and which has an opening for the flame to pass through; the cover (with handle attached), which also has an opening filled by a plug—all of fire-clay; and, finally, a plumbago lining. The rubber tube, chimney-connection and damper are like those of the other furnace.

Finally, at the right is shown the furnace for scorification and cupellation, which I have, I think fitly, designated as the "Monitor." Its form is almost that of the reverberatory furnace, the movable bricks, when in place, being the roof. Looking at it from another point of view, it may be considered as a muffle, with the flame as well as the heat inside. Its exterior dimensions are as follows: Length, 20 inches; width, 7 inches; and depth, 5½ inches. In the interior, upon the bottom, are four little wedge-shaped bridges of fire-clay, which are movable; and upon these rests a false bottom or floor, also movable. The latter corresponds to the muffle-bottom of an ordinary furnace, and upon it is done all the work. It is 3½ inches wide by 7½ inches long and ½ inch thick, and has a shoulder or bench running across its entire width on the end nearest the burner. The covering brick, 4 in number, are each 7 inches long by 2¾ inches wide and 1¾ inches high, with a slotted bridge for convenient handling. The series of 6 air tubes or chambers running its entire length. The spaces between the tiles are filled with a mixture of plaster of Paris and Venetian red, rubbed up together with water. The latter color is also used for the tiles themselves, and somewhat on the fire-clay portions of the furnaces. A ⅜-inch gas-pipe, with proper taps and nozzles, is screwed to the front of the table.

I have gone somewhat minutely into detail in the above description, for the benefit of such as may care to duplicate the outfit.



A GAS ASSAYING-PLANT.

connections are similar to those of the first-mentioned furnaces.

The 3-inch stove-pipes of all three furnaces are fitted into one long, horizontal pipe, which fits snugly into the chimney. The bench or table upon which rest the furnaces described, is made of pine, well-seasoned and firmly joined, to resist as much as possible the warping influence of heat, and to support the weight of the furnaces and table-tiles. In dimensions (not figuring on the top, which overlaps 1 inch all round), it is 4 feet 6 inches long, 1 foot 7 inches wide, and 2 feet 1 inch high, plus the thickness of the top, which is 1¾ inches. A double coat of shellac varnish is its sole ornamentation. To the sides and ends of the table-top are firmly screwed 4 strips of band-iron, 2½ inches wide, and ⅛ inch thick, and of such lengths as to alternately overlap at the angles, making smooth joints. The top of this sort of wall is ¾ inch above the bed of the table. Upon the latter are 114 fire-clay tiles, or rather clamps, such as are used to join house-tiles, and having the shape ⌐¬. Their average size is 3½ inches by 3 inches across, and 1¾ inches high. They are so arranged on the table as to leave a

The manner of operating the furnaces is simple. As regards the roasting furnace, it is necessary merely to shut off the dampers of the other furnaces, turn on and light the gas, and regulate the heat to suit the particular ore. The control of the mixture of gas and air is effected by means of the milled handle at the burner. In using the crucible-furnace, remove cover, turn gas on full at tap, light, and regulate by milled handle. Crucibles containing charges that are to be heated gradually can be placed in the furnace as soon as lighted; others, after the lapse of a few moments to allow the furnace to become thoroughly heated. Placing the charges in cold, I have made good fusions of refractory ores in 25 minutes from time of lighting. The furnace will take crucibles in size up to the Battersea "S" (4½ inches across by 5 inches deep).

Finally, as to the "Monitor" furnace, I wish to say a word of explanation. It is not my intention to claim originality as regards this furnace, but merely superior applicability and decided improvements in form. It was Mr. Thomas Fletcher, of Warrington, England, to whom we are indebted for so many ingenious forms of apparatus for the utilization of illuminating gas as a medium of heat, who devised the original little furnace which I employed successfully in assaying for a year and a half. This is the one I now employ as a roasting furnace, as shown in the cut. Its chief fault lay in the fact that but one scorifier or cupel could be operated at a time. This furnace had almost entirely escaped attention as an assay furnace, owing to its having been advertised mainly for melting small quantities of lead, copper, brass, etc. In fact, it had been withdrawn from the market when I took hold of it, with the idea of improving it so that it should be able to treat three or four or more scorifiers or cupels at once. With this object, the present furnace was finally constructed.

To manage it, remove the covering bricks, open the damper and shut those of the other furnaces, turn back the milled handle at the gas entrance to the burner, so as to allow a full flow of gas, turn gas on full at tap, light, and put back the bricks into place. In from 12 to 20 minutes the interior will be hot enough for work. The bricks are then removed again, the charged scorifiers are placed on the false floor, the bricks are replaced, and the excess of gas is turned off at the burner. When the charges have melted, slide the bricks aside more or less—principally those nearest the burner—to admit air for oxidation. In cupellation, the gas is turned down more than in scorification.

The time of performing either scorification or cupellation varies according to the nature of the ore, charge, size of button, etc., but is about the same as that occupied in the use of a coke-furnace.

The consumption of gas is not far from 30 cubic feet per hour. It is not intended or claimed that this furnace can take the place of one required to be run from ten to twelve hours per day; for that, of course, a solid fuel will be cheaper. But for short runs of from one to say four hours it is economical, as are also the others here described.

For small laboratories, therefore, the advantages of this furnace are many: convenience of operating, since the assayer sees every step and stage of the operation, and so can tell when and where to change or improve; comfort in manipulation, since it does not heat up the vicinity of the furnace and the room itself (quite a desideratum in the summer time); perfect control of the source of heat, so that a higher or lower temperature, a reducing or oxidizing effect may be produced in an instant; entire noiselessness (in which characteristic it is the superior of all blast assay-furnaces); saving of the time which, with furnaces employing coke, charcoal or coal, is spent in "bedding down," feeding, etc.; freedom from the annoyances of dust, ashes and smoke; and absence of waste. Finally, it possesses the advantages, which need not be dwelt upon, of simplicity of construction, durability and portability. Such simple tools as are required can easily be made from quarter-inch wire. The complete plant, as illustrated, costs about $75. The furnaces are manufactured by the Buffalo Dental Manufacturing Company, of Buffalo, New York.

It is currently reported at Bisbee that the Copper Queen company have paid to the owners of the Atlanta mine the sum of $40,000, in settlement of the former company taking ore out of Atlanta ground.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS

A Reminiscence of a Great Inventor.

History of the Sewing Machine Needle.

EDITORS PRESS:—To the best of my recollection it was in the spring of 1848 that I was in the sittiug-room of the depot at Canton, Mass., waiting for a train. There were not many people there—a few were moving round, while some, like myself, were seated. The lower back corner (that is on the down or Boston side) was occupied hy a mixed company of what appeared to be relatives and friends; the frout lower corner I occupied, the upper back corner was occupied hy one I took to he a minister, long-faced, thin in the cheeks, with high cheek hones. A wood-cut I saw lately in a magazine or paper of Bishop Porter, made me think he was the individual. The person occupying the upper front corner had a Vicar of Wakefield air about him that rather pleased me, hut his Byron collar told me at once he was not a minister. He had something heside him tied in a large silk handkerchief, that I took to he a bird-cage or a squirrel-house, or sometbing of that kind. My first impression was that he was a bird-fancier or rat-catcher. He was rather stout, with broad hut regular features and good color. His mouth was wide and his lips full, and taken in connection with the repose of his eyes, made me think that he had imagination and application in a high degree. My idle fancy soon began to surround him with pleasant associations, and I concluded he was a well-to-do farmer or dairyman. He gave a quick look at every one, I should say, in the room, then he rose and advancing to the door said: "I have somethiug here I will show you. It is a sewing machine, and I am going to Washington to get a patent." We all got up aud followed him. He untied the handkerchief and stood the machine on the platform.

It was something less than a foot square, having a frame of hard wood, with two spools of thread, one on the top of each of the front corners. The machine was put in operation—the minister expanded and expatiated. I was young and a foreigner, and rather diffident. I felt much interested, but did not like to intrude. Howe, with true politeness, opened the way for me to step forward. He evidently expected me to say something. I complimented him on his ingenuity and scope of his invention, and asked him if he had ever seen a Lappit loom. He answered that he had not, but evidently concluding that it had some connection with a sewing machine, he appeared interested. I explained to him that Lappit cloth was a thin white muslin, used for window curtains, with small, detached flowers, made with coarse, soft yarn, and which were worked in hy needles, with an eye on the end. The cloth had a wrong and a right side, like cassimere, but the connection thread on the wrong side was trimmed off. By taking hold of the end of the thread and pulling, the flower would come out. When I was little I called this magic, but my exhibitions were unprofitable and got me into serious trouble. I explained to him that a Lappit needle working in a direct line on two pieces of cloth was a sewing machine. He asked me where he could see a Lappit loom, I directed him to Reed's Factory, Washington Street, Glasgow, Scotland. He noticed in a pleasant way the American name to the street. I replied that the street was called after George Washington and that I helieved Mr. Reed was an American. At first he was interested, he now appeared a little excited. He took me warmly by the hand, and I must say I liked the pressure of his big warm hand. We parted with promises, which I am sure he would have filled had I corresponded. If my suggestion was any benefit to him he was very welcome. Independent of his inventive genius I liked the man. M.

Sweetwater Mines.

EDITORS PRESS:—The Kentuck mine has levied an assessment of 5 cents per share. The late storm has retarded mining operations to a considerable extent. It has been snowing and blowing for seven days.

The Star lode had several tons of ore worked at the old mill, which pulped $75 to $83 per ton, the front lode being the best. They will work all winter.

Several mines had ore worked at the new mill, to wit: the Home Stake, 3 tons pulped $266; 10 tons of Poverty, $43; 10 tons Lady Hayes, $33; Silverado, 50 to 60 tons, result unknown.

The new Look-out Company have located a mill-site, with water-power, on Sweetwater creek, below Messamar's tunnel, and intend to build a 15-stamp mill in the early spring. Work is prosecuted in the mine constantly, and a large house is erected at the mouth of a new tunnel just started.

The Kentuck Mining Company have in their office large specimens of sulphuret ore, recently taken from the winze below the 500-foot level. It is nearly half black sulphuret of silver.

Sweetwater, December 29th. R. T. S.

FOR the forty-fifth time in his life, Dr. Palisa, of Vienna, has discovered a small planet, increasing to 243 the total number of tiny worlds known to belong to our solar system.

The Cœur d'Alene.

Hearing that Mr. C. D. Porter, the noted mining expert, was in town direct from the Cœur d'Alene country, a Salt Lake *Tribune* reporter went in quest of him. Mr. Porter was decidedly averse to being interviewed, hut said that he would most willingly give the *Tribune* any information he could about the country, and the following interesting facts were elicited: The outlook on Pritchard creek and vicinity is hetter than the most confident friends of the country would have ventured to hope a few months ago, and there are about 2,500 people now on the ground who are doing well, and up to the time that winter set in, and the output from the diggings was steadily increasing in value. The gold is very coarse, and runs about $17 to the ounce. Some nuggets have been found worth $400. The town of Murray is 33 miles from Thompson's Falls, the nearest station on the Northern Pacific, and a sled-service has been established to run this winter between those two points. The country is low and warm ou Pritchard creek, so that there are sure to be thaws during the winter which will enable the miners to carry on considerable sluicing, but work will not proceed at full blast till next spring.

On top of the mountains above Pritchard creek there is an ancient river bed, called by miners the "Old Wash," in which two men with a common rocker have taken out as much as a pound of gold in one day, and it is anticipated that the real bonanza of the region will be found in the "Old Wash" as soon as a proper supply of water can be brought there. Work looking to this result has already been commenced, and a ditch, now well advanced, will cover one of the richest parts that has been prospected. Very little can be done in the way of mining until spring.

John Burke, formerly of Salt Lake, has completed a ditch to some valuable ground owned by himself and others, and will commence sluicing early in the spring. Richard Cummings, with about 15 inches of water, has been working on the "Old Wash" near Murray, and has taken out at least one ounce per day to the man on an average. In Pritchard Creek the developments have been very satisfactory to the owners, and all claims from Oshorne to Butte that have been developed have given such good results that the lucky proprietors are perfectly satisfied to stay with their prospects.

The prospect for quartz mining is also brightening up. Golden Chest mine in Reeder Gulch, has been sold to a company from Louisville, Ky., which, it is understood, will put up a fine mill and other improvements next season. The famous Mother Lode, the Occident Lode, and two or three other quartz claims, also 40 acres of placer ground on Pritchard Creek, have been sold to English and Colorado capitalists who intend to press forward the work of development with energy, in the spring.

On Trail Gulch, four miles from Murray—a tributary of Beaver Creek—the developments have been far beyond the most sanguine expectations, the Mahoney claim, Van Dorn har, and many others, the names of which Mr. Porter could not recall, are found to be marvellously rich, while Potosi Gulch and two or three other tributaries of Beaver are no less promising, and Eagle Creek, near the head of the stream, had become a steady producer before the winter set in. On upper Beaver Creek, some good lead and silver ores have been found, and on Canyon Creek, 10 miles from Murray, John Burke and others are working upon a prospect which must become, unless indications are very deceptive, a great mining property in the near future. Four miles south of Canyon creek, on the south fork of the Cœur d'Alene river, at a place called "Nigger Prairie," some very rich silver ore has recently been found. "In fact," said Mr. Porter, "the future of the great northwest looks brighter than any part of the country I know of. New camps have recently been established at a point fifty miles north of Spokane Falls, near a place called Chewelah, and one on the Pen d'Oreille river, about thirty miles from Calispeel station, on the Northern Pacific railway. The coming season will convince people of the merits of the region, and throw into the shade some of the best mining sections ever discovered in this country."

MINING IN DEL NORTE COUNTY.—The Del Norte *Record* says: Mining, which has been going on in different parts of the county ever since its settlement, is now mostly confined to the hydraulic system. About thirty miles from Crescent City is the mine known as the Big Flat gravel mine, owned hy a joint stock company, O. M. Paris being one of the principal owners. About $200,000 was expended in bringing water and other appliances to this mine by a Boston company before any gold was taken out, and before the property fell into the hands of the present owners, but now it is paying a handsome dividend. Other mines of a lesser magnitude are on this side of the mountains, but a greater part of the paying mines in the county are situated on the Klamath river and Indian creek, in the vicinity of the town of Happy Camp. Of those that are most noteworthy are the Bunker Hill claim, owned by Temple & Childs; Wingate Hill, also owned hy Mr. Temple; the Grider claim, Camp & Co. owners; the Happy Camp claim, formerly owned by H. Gasquet, but lately purchased by W. I. Smart, an Eastern man; the Del Norte, owned hy S. S. Richardson, and the Muc-a-muc, hy A. Doolittle, and the China creek claim, Jas. Reeves owner. All of these mines are hydraulic, and during the rainy season, and until late in the spring, they are worked with varied success, but always paying well. In the immediate vicinity of Crescent City there are no mines now in operation, though a few years ago heach or black-sand mines were extensively worked just helow town with good success, a large amount of gold having been taken out, hut of late years, for some cause, the mines have laid idle.

Assay of Tin.

Cassiterite is a tin-oxide of tin. It is found in nature hoth crystalline and amorphous. In its former state it occurs in veins, intersecting granite, gneiss, mica-schist, porphyry, and other rocks. In its latter condition it is found in rounded uodules or grains, from several pounds in weight to the finest black or hrown sand. This is called stream tin, hecause it is found in placers like gold, in the heds of streams, into which it has heen washed hy the action of water, resulting, like placer gold, from the disintegration of rocks which contained it in veins, its great specific gravity (6.4 to 7.1) causing it to resist the force of the water which has washed away lighter minerals. Stream tin is found of various colors and texture, being black, brown, drab, or nearly white; perfectly compact and amorphous, laminated, mamillary, or hotryoidal, with elevated points (toad's eye tin), fihrous (wood tin), concentric, radiated, etc. H. 6—7; luster, adamantine when crystallized, stream tin dull, nearly transparent to opaque. Tin is also found in nature as a sulphide, hut is comparatively rare. It has been found also in meteoric stones.

The State mineralogist in his report gives the following method of making a test:

Cassiterite is easily reduced to the metallic state in a crucihle with carhonate of soda and anthracite coal dust (culm), or cyanide of potassium. The crucible should be allowed to cool, and then be hroken to remove the button of tin; for this operation a hot fire is required. B. B. on ch. easily reduced if the following plan is adopted: The ore supposed to contain tin should be pulverized and passed through a 40 to 60 mesh sieve, the resulting powder washed in a pan of horn spoon to a small quantity, the *prospect* dried and ground in an agate mortar with twice its bnlk of carhonate of soda. This mixture is transferred to a cavity in a piece of charcoal, and heated in the R. F. until the assay assumes a spherical form, more is added until a glohule is obtained half the size of a pea; a small piece of cyanide of potassium of ahout equal size is then placed with it, and hoth strongly heated in the R. F.; globules of tin will immediately appear if the metal was present in the ore, which hy a little skillful manipulation may he made to coalesce into one, or the assay may be cut out of the charcoal with a knife, and ground with water in an agate mortar, when the heads will flatten into small discs under the pestle, and may be separated by washing. To be sure that the metal is really tin, the following experiment may be made: Place the head on clean charcoal without fluxes, and heat first in the reducing and then in the oxidizing flame. If tin, it will lose its metallic character and become a white oxide, which it will he found very difficult to reduce again to a metallic glohule. This may he effected by the addition of a small piece of cyanide of potassium. Observe that no distinct coating is formed on the charcoal, which would be the case if the metal were lead, remove the bead to a small anvil and strike it with a bammer until flattened out (antimony and hismuth are brittle).

The hutton hoiled in a test tube with nitric acid does not dissolve, bnt is changed into a white insoluhle powder. Antimony gives a similar reaction, but is brittle, and on charcoal would have hurned, and given off thick white fumes of oxide of antimony. These tests will serve to distinguish tin from other metals which it resemhles, hut another still more characteristic test may he made as follows: Reduce a bead of tin from the ore hy the method above described, hammer it out very thin, place it in a clean test-tuhe and pour hydrochloric acid over it; action takes place, and the metal dissolves. Before solution is complete (a portion of the metal remaining undissolved) pour a few drops of the solution into a vessel contaiuing a dilute solution of terchloride of gold, a purple color will he produced, which leaves no doubt that the metal is really tin. These tests are described with considerable attention to detail, hecause tin is liahle to be found in quantity in California, and it is desirable to furnish the prospector with information by which he can test the ores he may find, supposed to contain tin. It is very important to concentrate a considerahle quantity of the ore, as described, for experience has shown that tin may exist in small quantities in minerals and ores, uot indicated hy the appearance. Great care should he observed in the use of cyanide of potassium, which is a *deadly poison*.

AMERICA now leads the world in the quautity as well as the quality of copper produced, and its manufacture into hrass and other forms of finished metal is one of the leading industries of the country.

Alaska Mines.

Governor John H. Kinkead, in his report on Alaska to the President, says:

In the vicinity of Sitka, and in the region of Prince William Sound and Cook's Inlet, as well as in many other places—in the Chilcat River country, for instance—the promises for the future are good. The geological formation and general characteristics of most of the islands in the archipelago and the contiguous mainland are apparently the same.

I confidently expect that within the next decade the production of precious metals in the district will he an important factor in the finances of the general Government.

The presence of ores in the district is not a new discovery. The fact of their existence has long heen known, but the industry has languished and been almost ahandoned, for the reason that the only title to the property of the miner recognized was that of force; not always, hut still frequently enough used to discourage and measurably prevent exploration. This evil will he remedied hy the introduction of civil law.

The difficulties attending the successful prosecution of this industry are great. High and precipitous mountains, densely covered with timber and chapparal, fallen and decaying trees; the earth covered with moss and vegetation to the depth of one or two feet, seem almost to forhid the progress of the prospector.

To compensate for this, however, there is unlimited water power and an abundance of fuel existing almost everywhere, and within easy access from the mining districts hy any class of ocean steamers. The difficulties will be overcome, and the natural advantages utilized slowly, yet surely. The adverse conditions, indeed, do not exist even now throughout the entire country. Westward from ahout longitude 140, and north of latitude 60, the timber belt ceases abruptly, and on the Alutian Islands and the shores of the mainland, the country is open and free from the foregoing noted difficulties. The great interior, also, though having plenty of timber for practicahle purposes, is generally well apapted to mining and successful exploration. With the development of the mining interests, population will iucrease, and other industries progress as a natural consequencc.

Coal, copper and other minerals are known to exist in many localities in the district. To what extent they have been developed, I am not yet informed, although I learn that explorations in this direction are being actively and energetically pursued.

AUSTRALIAN MINES.—A Russian miuing engineer, now in this city, who has recently come from Australia, having spent some months in New Zealand, New South Wales and Victoria, says: I do not think mining there is so active and paying as in former years, having been greatly superseded hy the wool interest. Most of the activity and progress made is due chiefly to the liherality of the Government in building railroads, water races, supplying diamond drills for prospecting and helping along mining in every other possihle way. I first visited New Zealand. There placer mining is principally carried on, the quartz mining heing confined to the other places. A great amount of capital has been introduced in this country. Gold quartz mining does not appear to be very profitahle, and very little is done with silver. They have immense hodies of rich copper ore, but its present low price makes its workings very unprofitable. The geological formation of the ores I found to he the same as those of Siberia. In Ballarat, the chief district for deep alluvial mining, the ores, as a rule, are not very rich, although they exist in large bodies. The biggest mill I found had 25 stamps, and there are 50 or more of this size. The deepest mine is down 2,400 feet, and is in the Clune district, near Ballarat. The ore was at first quite rich, but is now very low. They are still sinking, in the hope of striking it rich again. The deepest placer shaft is 600 feet deep. Generally the veins are found to he very irregular, but in the Sandhurst district there are 12 parallel veins, from 3 to 50 feet wide, which have already been prospected a distance of 6 miles. A general freedom is accorded in locating claims, and from 1 to 30 acres may he staked for placer mining. In locating lodes, they must not be less than 100 nor more than 600 feet in length, and from 50 to 200 feet is allowed in width. They have the hest kind of machinery of all kinds, of American inventiou. They have manufactories of their own, hut work after American models. I do not consider them as well made as the engines, etc., turned out here, and, as I have already stated, I shall prefer to buy in California.

THE Silver Odessa mine, in East Calico, is looking exceedingly well, especially for a mine that was supposed hy those familiar with the "tactics" of miniug operations to be "played out." A tunnel several hundred feet in length has been driven through the hill, which follows the meanderings of the principal ore vein. At brief intervals in the tunnel can he seen small seams of very rich ore, which widen every few feet into pockets of hlack metal, chloride and horn silver. At numerous points prospect drifts have heen made, all of which penetrate ore. The ore hody extending through the hill is 40 feet wide.

MECHANICAL PROGRESS.

Improved Workmanship.

Said an old and long experienced machinist ths other day, one of a firm of well-known manufacturers: "I should be ashamed now to father soms of the nice jobs I prided myself upon 30 years ago. I was a first-class machinist, and got firs -class pay; but I have msn in my shop, not yet out of their four years' apprenticeship, who can do a better job than I could thon. And it is not all owing to improved machine tools; it is because better work is exacted, and better instruction is given to apprentices."

The reduplication of parts and of entire machines in modern practice is one reason for this improvement in individual skill. In addition to the necessary hand-work in making templates, jigs, gauges nnd other appliances for reduplicatioo, there is much more exactness in fitting than formerly, requiring individual judgment, patience of work and skill of hand. The modes of doiug work hnve been greatly changed; patterns for the moulder ars made to such modifications of the old-fashioned rule of "one eighth of an inch to the foot for sbrinkags" as would astonish a Rip Van Winkle of a machinist or pattern maker. Some patterns require very intricate calculations and very exact proportions before they finally leavo the patteru shop for the fonudry. Castings uow come from the pickling room, requiring only n superficial dressing to fit.

So, ths forger must work to the line. Thirty years ago, if tho forger's product rssembled the object intended as closely as Hamlet's cloud did a whale or a camel, it was as near as could be expected; but now there are jobs coming from the forging shop that it seems a shame to submit to ths tearing planer and the rasping milling machins. Thirty ysars ago a machine tool new from the shop was expected gradually to work itself into usable shape; the carriage and foot stock of a lathe wsre to gradually adapt themselves to ths ways of the lathe, and the cross-head of the new planer had to be gibbed up again and again, and perhaps ground with flour of emery and oil, before it fitted the uprights; and it was a common practice to run the platen of the new planer back and forth, for a day or so, with the Vs loaded with emery and oil.

To-day the new tool works as perfectly when first started as when months old; a result to be attributed more to the patience and skill of the workman than to the improvsments in the tools he uses; the scraping to fit of the modern machine shops demands as much judgment and hand skill as it does of patience.—*Scientific American.*

How to Succeed as a Mechanic.

Many of our readers know the reputation of the Maydole hammers, hut few of them, perhaps, are acquainted with the history of the man whose nams has become associated with his goods, and which is a guarantee in itself of the very best quality. In an address before one of ths husincss collsges in Washington City, the late President Garfield rslatcd a story, illnstrating the success that is sure to follow persistent effort in a worthy cause, when exerted in the proper direction. Hs gave an outline of the life of Mr. Maydole, which will bear repeating. "Thirty years ago a boy was struggling through the snows of Cbenango valley, trying to hire himsslf out to a blacksmith. He succesded, and learned his trade: but he did more. He took it into his head that he could maks a better hammer than any other man had made. He devoted himself to the task for more than a quarter of a century. He studied the chemistry of metals, the strength of matsrials, the philosophy of form. He studied failures. Each broken hanmer taught him a lesson. There was no part of the process that hs did not master. He taxed his wit to invent machines to perfect and cheapen his processes. No improvement in working steel or iron escaped his notice. What may not 25 years of effort accomplish, when concentrated on a singls ohject! He earned suecess; and now, when his name is stamped on a stesl hammer, it is his note, his bond, his integrity embodied in steel. Ths spirit of the man is in each hammer, and the work, like the workman, is unrivaled. Mr. Maydole is now acknowledged to have made the hest bammer in the world. Even the sons of Thor, across the sea, admit it. While I was there, looking through his shop, with all its admirahle arrangements of tools and machinery, there came to him a large order from China. The merchants of the Celestial Kingdom had sent down to the little town to get the best that Anglo-Saxon skill had accomplished in the hammer business. It is no small achievement to do one thing hetter than any other man in the world has done it."

TO CENTER AN ENGINE.—Move the engine hy the fly-wheel toward the end on which you wish to center it, till the cross-head is near the end of its travel, and mark the slide even with the end of the cross-head, and then with the surface gauge, or any fixed point, make a mark on the fly-wheel rim, crank disc, shaft or any finished revolving part, pry the engine past the center and till the cross-head passes the mark on the slide; then pry hack again till the cross-head agrees exactly with the mark on the slide. This last, in order to have all lost motion in connecting rod taken in same direction both times. With engins in present position make another mark on the revolving part first selected. With a pair of dividers bisect the distance between these marks nnd pricepunch the spot. Pry the engine around until this point coincides with ths points of your surface gauge, and the crauk is absolutely on the dead center, if the axis of the piston rod and axis of shaft are in tho samo plane, as they should bo.—"*Amos K.*," *in Steam.*

TEMPERING THIN MILLS.—It is a somewhat risky job to hardeu and temper, without springing, thin lathe saws, or milling tools, made from sheet steel. When sprung, they *may* be straightened, if not too much out, by hammering; but not one machinist in teu knows just how to it, and no verhal instruction can teach the trick. But a good workman, who is not afraid to tell his secrets, says that he nevor fails. His plan is to have two disks of cast iron, preferably of a size small snough to allow the teeth of the saw to project beyond their rims. The inner face of these he scores (in the pattern, of course) into radial and annular scores, so that the engaging faess will present only minute points. These castings are chucked and faced so as to be true, and the saw placed between them and held by n nut and bolt passing through a central hole. Plates and saw are heated together and chilled togethsr in the oil, which, by means of the scorcs, is allowed to reach nearly the entire surface of the saw. Thero is no springing of the saw under this treatment.—*Scientific American.*

FASTENING A BELT.—A correspondent of the *Woodworker* says about fastening a bslt: After quite a good experience with a great many ways of joining, I must say that above all others I prefer lapping and riveting, and I will give my reasons therefor. First, and above all other things, a riveted joint is the cbeapest. I don't mean cemented and riveted, but lapped and riveted, taking care to skive nicely, so that the joint will not bs clumsy, making the scarf according to the size of the belt. Do not scarf the ends down too thin; if you do the rivets will be likely to tear out. A little practice in this style of fastening a belt will make you do a nice job, and if you once get used to it I will warrant that you will never use any other method. It takes no more time, if as much, as it does to either lace or hook a belt with any device I have evsr seen, and I have seen a great many. This style of fastening should be used all over the mill, whether driving belts or not.

A STEEL SUBSTITUTE FOR WOOD SLEEPERS. The Barrow Hematite Steel Company, says tbe *Ironmonger*, ars expsrimenting, with the view of manufacturing steel railway sleepers as a suhstitute for, and at about the same cost as, wood sleepers. A similar experiment has been tried at the works of the London and Northwestern Railway at Crswe, but has not succeded, inasmuch as, by the use of rail ends and other scrap, the cost of ths steel sleepers has always heen a few shillings mors than those made of timber. The Barrow Company have received an order from ths Northeastern Railway Company for a number of steel sleepers, and by the judicious application of tbe best machinery it is helieved that ths attempt to make steel sleepers at the sams cost as wood will be successful.

ITALIAN MECHANICAL INDUSTRY.—The Italiau Admiralty is about to make an attempt to emancipate Italy from foreign machine builders, not only as regards the manufacturing, but the designing of steam engines. Hitherto Italian establishments and work-shops have simply copied foreign desigus. To attain ths object now aimed at, the seven principal mechanical firms of Italy have been invited to send in complete designs for 6,000 horse-power engines for a transport now in course of construction, and the invitation has heen accepted.

MOLDING SAND.—A large proportion of the molding sand consumed in the foundries of the United States is dug out of the hills of Albany county, N. Y. It is said that everything in fusible metal, from a Krupp gun tb a heel plate for a lady's shoe, has heen cast in Albany sand. Quantities of it have been exported as hallast. The annual shipment of sand (obtained thereabouts) from Albauy is estimated at 75,000 to 100,000 tons, the price paid for it, delivered on hoard the cars or boats, being about $1.25 per ton.

THE SOUTHERN IRON INDUSTRY.—It is a curious fact that while the iron mills in the North are nearly all idle, or running half time, in consequence of the stagnation in trade, the most prosperous industry in the South to-day is the iron manufacturing husiness. There has not heen a single furnace closed tbis year, and an extraordinary fact in connection with it is that the iron furnaces are said to he nearly all running ou orders received from north of the Ohio river.—*Boston Commercial Bulletin.*

SAW TEMPERING BY NATURAL GAS HEAT.—Messrs. Emerson, Smith & Co., Limited, of Beaver Falls, Pa., are, we helieve, the first to use natural gas in heating furnaces for hardening and tempering saws. It is claimed that, natural gas being composed so largely of "hydrogen" and entirely free from sulphur or other base substances, and giving a steady, regular heat, steel is strouger and rendered less hrittle and less liable to crumble than when hcated hy coal or coal gas.

SCIENTIFIC PROGRESS.

The Velocity of the Moon.

We can faintly picture, says Profsssor Langley, how it would seem if we were placed at a station in space near ths lunar orbit and could see ths moon, a moviug world, rush by us with a velocity greater than that of a cannon ball in its swiftest flight. This fesling may be almost realized, in fact, by witnessing from some high mountain the shadow of the meon as it passes swiftly by during an eclipse. On such an occasion its shadow actually travels along ths earth with the same speed of its flight in space. The obssrver upon some lofty point from which his vision reaches many miles to the west can easily discern and follow the approaching shadow, and witness the actual velocity of a heavsnly body, as it were, brought down to him. Such a sight was once witnessed and described by some one in this State (Prof. Davidson, we think) from an elevated point on the Sierras.

Professor Langley gives the following other instances: The reader who has ever asconded to the Superga, at Turin, will recall the magnificent view, and be able to undorstand the good fortune of an observer (Forbes) who once had the opportunity to witness thence this phenomenon, and under an nearly cloudless sky. "I perceived," he says, "in the southwest a black shadow like that of a storm about to break, which obscured the Alps. It was the lunar shadow coming toward us." And he speaks of the "stupefaction"—it is his word caused by the spectacle. "I confess," he continues, "it was the most terrifying sight I evor saw. As always happens in cases of suddsn, silent, unsxpected movements, ths spectator confounds the real and relative motion. I felt almost giddy for a momcnt, as though the massivs building under me bowed on the side of the coming eclipse." Another witness, who had been looking at some hright clouds just before, says: "The brigbt cloud I saw distinctly put out like a candle. The rapidity of the shadow, and ths intensity produced a feeling that something material was sweeping over the earth at a speed perfectly frightful. I involuntarily listened for the rushing noise of a mighty wind."

Pyronaphtha — A New Illuminating Material.

According to reports of recent Russian periodicals and scientists, the carth oils of Baku bid fair to introducs to the world som thing quite new in the way of an illuminatiug material—a material with illuminating fully equal to kerosene, but without its dangers. A recent St. Petersburg paper says: An interesting trial was lately made in St. Pstersburg with a new illuminating material which is destined, it is considered, to take the place of kerosene. This is an illuminating oil, said to be absolutely fres from danger of fire. An expsriment was mads as to the power which pyronaphtha has of extinguishing fire, and it was found that burning kerosene was easily put out by it. Pyronaphtha can itself hs extinguished hy water. It is a product of the distillation of napbtha residus, of which large quantities remain from the Baku distillation of petroleum. From these illuminating gas is produced, and likewise pyrenaphtha. The idea would seem to have hitherto been carried out only by Ragosin & Co., of Baku. A celebrated Russian chemist, Professor Beilstsin, has examined pyronaphtha, and has expressed his conviction that it has a brilliant future hefore it, and that it must eventually replace American and Russian kerosene. The specific gravity of pyronaphtha is .864, and it ignites only at 230° F. It burns without smoke and vapor at 259°, gives a hrighter light than kerosene, and is consumed less rapidly, while its prime cost is less. At St. Pstersburg it is heing adapted for domestic use, and Messrs. Romberg have constructed a special burner for that purpose.

A BALLOON BATTERY.—There is an arrangement of Daniell's battery, called "balloon batteries," which has been and is still used in some countries. It needs no attention for six months or more at a time. The cell is surmounted with a flask, open at the bottom, which contains two pounds of sulphate of copper crystals, and is filled with water. The flask is closed with a perforated cork, fitted with a glass tube. This tube descends as far as the liquid in the porous jar. The solution of sulphate of copper heing more dense in proportion as it is more concentrated, it can be seen that the part of this solution which is in the porous jar is constantly held at saturation, for as it weakens it is supplied by the saturated solution which descends from tbe flask. The glass jar of the cell is closed with a wooden lid, which supports the flask. The result is, the evaporation is reduced to almost nothing, and consequently there is a very slight or no formation at all of climhing salts, and the liquid is preserved. This battery has been known to work for more than a year without requiring any attention, during which time it has satisfactorily met all practical requiremen's.

A SPLENDID AEROLITE SECURED.—An aerolite fell on the farm of C. Francois, at Chateau Richer, a short distance from Quchec, at 3 A. M., on Saturday, December 13, 1884. It was dug from the ground, in which it had smbeddsd itself, and was found to measure about a foot in diameter. The people were so startled hy the intcuse light that many rushed out of thsir houses to ascertain its causs. They say that the falling meteor presented the appearancs of a huge ball of firo, which lightsd up the whole country side almost with the brilliancy of the noonday sun.

SHORT-SIGHTEDNESS.—A writer in the Loudon *Times* claims that short-sightedness is csused by the too constant application of the eyes to near objects—such as poring over books and too constant application to small, fine handicrafts. When the eyes are directed to a near object, they are turned in or rendered convsrgent, in order that the axis of visiou may meet upon it, and this position is maintained by a muscular effort, which, if continued, alters the shape of ths eye in ths direction of elongatiou. Manifsstly ths elongation will bs most sadly effected during the youth, when the tissues of tbe hody, including those of the eye, are comparatively lax and distensible, and it will also be most easily affected among thoss young people whose tissues ars sxceptionally weak by reason of inadeqnats food or unhealthy descsnt or surroundings. Badly lighted school-rooms are the greatest manufactoriss of short-sightedness, tbs bad light compelling approximation of the books or other matsrials of study.

DISCOVERY OF THE CIRCULATION OF THE BLOOD.—The history of the discovery of the circulation, recapitulated, divides itself naturally into a series of epoch-making periods: 1. The structure and functions of the valves of the heart, Erasistratus, B.C. 304. 2. The arteries carry blood during lifs, not air, Galsn, A.D. 165. 3. The pulmonary circulation, Servetus, 1553. 4. The systemic circulation, Cæsalpinus, 1593. 5. The pulmonic and systematic circulations, Harvey, 1628. 6. The capillaries, Malpighi, 1661.—*Dr. Henry C. Chapman.*

HEAT CONDUCTIVITY OF SOILS.—The author's conclusions are that ths hsat conductivity of a soil is so much the greater, ths more densely its particles are packed togsther. The difference thus occasioned is the more considerable, the higher ths proportion of water. In a dry soil the heat conduction rises witb an increase in the size of the particles of ths soil. Watsr increases the conductivity of the soil considsrably, the more, the larger its proportion in the soil, the circumstances being equal.—*Dr. F. Wagner.*

BIOLOGICAL STUDENTS AT CAMBRIDGE UNIVERSITY increase in number so rapidly, owing to ths great facilities afforded of late years, that it is almost impossible to keep pace with the demand for larger work-rooms and lecture-rooms. No lecture-room in the University is largs enough to accommodate the class in slementary biology under Messrs. Sedgwick and Vines' instruction during the present term.

DR. KOCH'S CHOLERA MICROBES.—Dr. Klein, appointed by the government of India to investigate the cholera question, has satisfied himsslf that the minute organism or "microbes" discovered by Dr. Koch are not the cause of cholera. He has shown the strength of his conviction by swallowing some of the microhes, and no evil result followed.

DISTRIBUTION OF THE MINNOW.—In Switzerland the minnow reaches an altitude of about 7,900 fset above the sea lcvel, according to Mons V. Fatio, and the miller's thumb one of 7,200 feet. The perch stop at 6,500 fest, and no others pass above 2,600 feet, although the carp, tench, rudd and chub have been successfully introduced at 3,500 to 5,600 feet.

SAFFRONS, from the south of France, are said to contain a very small quantity of alumina, not by way of an adulterant, but naturally. Ths alumina is present only in the proportion of 0.115 to 0.123 per cent. Certain lycopods and *Rohus arcticus* are the only plants in which alumina has hitherto been discoversd.

EFFECTS OF SUN-SPOTS.—In 1859 a magnetic storm of unprecedented magnitude continued from August 28th to September 7th. Prof. Balfour Stewart has pointed out that this was synonymous with the period of maximum activity of one of the largest sun-spots ever observed.

THE SAN DIEGO SOCIETY of natural history has received an addition to its herbarium of 700 species of southern and lower Californian plants. This series of plants will be known as the Orcutt herharium.

PIANOS are played and corn popped hy electricity at the American Electrical Exhihition in Boston. Pretty soon hashful men can pop the question by electricity.

A SHAVING from a deer's hoof, with a powerful microscope and polarised light, is as wonderful a thing to hehold as is the rainhow.

LINES have been ruled upon plates as fine as one million to the inch. Of course they can ho discerned only with a powerful microscope.

ONLY TWO.—There are hut two living species of elephants, the Afriean and the Asiatic.

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:

Saturday Morning, Jan 10, 1885.

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Passing Events.

The most notable item of the week in mining matters is that relating to the probable closing down of the copper smelters at Butte and Anaconda, Montana, owing to the low price of copper. The metal is now 9½ cents in New York, and the Montana smelting men say it costs 9 cents a pound to lay it down in that market. High rates of freight must come down, they say, or they will have to stop the smelters in Montana.

The full figures of the gold yield of this State are not yet to hand, but those so far gathered show a large falling off on the product for 1884.

The Legislature convened at Sacramento this week, but so far little business outside of organizing has been done.

Some of the lead smelters of Utah are talking of shutting down unless the price of lead improves shortly.

A great many mines were re-located throughout the coast on the 1st instant, former owners not having done the assessment work required by the laws. Very few cases of conflict are reported.

ANNUAL MINING REVIEW.—Our review of the mining industry for 1884, will be published in the PRESS of the 24th inst. We hope our friends in the smaller and less prominent camps will send us in some notes for publication in that number. We shall be glad to receive accounts of mine and mill work generally. Even rough notes will be acceptable, and we will arrange as required. Such letters should be received here by the 19th inst. at latest, to be inserted. We hope our friends will respond to this request.

Salt in Nevada.

The largest deposits of salt on the Pacific Coast are found in Nevada, where they occur under various conditions. The most extensive and remarkable of these deposits is that on the Rio Virgen, a few miles north of the Colorado river, in the extreme southwestern corner of the State. A formation exists at this point composed of rock salt, resting on, and to some extent intermixed with, a sedimentary granite, and of such magnitude that it may be said to constitute a notable portion of the mountain in which it occurs. More than 60 per cent of the entire mass appears to consist of hard rock salt, having the color and transparency of clear ice, and containing over 90 per cent of the chloride of sodium. This formation extends along the eastern bank of the Virgen, presenting a bluff face to the stream for a distance of over twenty-five miles, and is in some places several hundred feet thick.

This deposit is worked after the manner of an open quarry, the salt being removed in blocks weighing often many pounds each. Although blasting is sometimes necessary in breaking it out, large quantities of quite pure salt can be obtained here at very little cost. Some twenty miles up the river is another hill of salt. In the same neighborhood, at a point one mile north of the Colorado river, on a mesa composed of small pebbles, earth and boulders, occurs a circular opening about 100 feet across, and of great depth, forming a sort of natural well, with nearly vertical sides. This is filled to within about 50 feet of the top with water, supersaturated with salt, this pool being apparently all that is left of the "dead sea" which once covered the entire region. These salt beds are in an isolated locality.

The other more notable salines of Nevada consist of salt springs on the line of the C. P. R. R., near White Plains, Churchill county, where there are large vats for making salt by solar evaporation. These vats are shallow excavations, enclosed with low embankments, with which the brine is run, being lifted with pumps from some of the springs. Most of the mills in Virginia City and throughout western Nevada are supplied with salt from this source.

As it fairly represents a large class of these deposits, a description of the general features of this Sand Springs saline will serve to convey a pretty good idea of the whole. The saliniferous land at this place occupies a depressed portion of an extensive alkali flat, this depression being always marshy, and, during the wet season, covered with a few inches of water. Spread over it is an incrustation of impure salt from two or three inches in thickness, brought up by efflorescence from below. In collecting the salt this crust is broken up and scraped into heaps with broad wooden hoes, the ground being divided into long strips, which are gone over in regular order. These heaps, after being left to drain off for a few days, are carried out on wheelbarrows or cars and thrown on platforms, where, after undergoing some further drying, the salt is sacked and is ready for shipment. As soon as this surface incrustation has been stripped off, it begins to re-form, the process going on so rapidly that several crops can be gathered yearly. As the ground below is heavily charged with salt, the process of replacement, were the surface removed, would no doubt go on indefinitely. The salt collected here, though not very clean, being mixed with a small percentage of sand, soda and other impurities, answers well for metallurgical purposes, the alkali present tending to clean the quicksilver and intensify its action. A large portion of the alkali flat outside of this depression is covered during the dry season with a thin coating of salt, generally too high and too much filled with foreign matters to be gathered.

The Great Salt valley is forty miles north of Sand Springs. Under the top incrustation here comes a stratum of blue clay eighteen inches thick, and then a lead of crystallized salt.

In the easterly part of Esmeralda county, and having the town of Columbus as a center, is a series of immense alkali flats, containing heavy deposits of salt. At Rhodes Marsh, one of these group, hundreds of acres are underlaid by a hard pan of solid salt, more or less mixed with mud and sand. Into these, holes something like tanners' vats are dug and soon fill with water holding salt in solution. The water evaporating, in five or six weeks the salt is left. At Silver Park, forty miles southeast of Columbus, incrustations of salt cover several hundred acres. There is also a marsh twenty miles south of the old overland stage road, near the Utah line, and 175 miles west of Salt Lake. In early summer the marsh is covered several feet with water from melted snow. Late in the season, when the water evaporates, a crust of salt, from two to eight inches thick, is left. Mills in that part of the State are supplied from this marsh. In Big Smoky valley, Lander county, and in Cortez District, sixty miles further south, large areas of ground are found covered with a thin crust of salt. In fact, workable deposits of salt occur all over the State of Nevada. The active season of work at most of the deposits is from April to December. There are some $75,000 or $100,000 invested in the salt business in that State. Indians and Chinamen as well as white men are employed.

Mexican Smelting and Refining.

In the last number of the PRESS was given a valuable and interesting article by Mr. A. Gmehling, of Parral, Mexico, on "Smelting in Adobe Furnaces and Refining in the Mexican Vaso." This very crude method of ore reduction is applied in many parts of Mexico. The figures given by Mr. Gmehling show conclusively the irrational and primitive method of this work. The question forcibly presents itself, Whence the enormous loss of the respective methods? Part of the causes, Mr. Gmehling correctly surmises, will readily be found in the improper construction of the furnaces, which are usually erected at very slight expense. The smelting capacity of such furnaces is very limited, and the ores remain in contact with the rising gases for an extensive period. The oxide-lead ores are therefore partly reduced far above the actual line of fusion, and a large percentage is carried off with the fumes. Owing to the slow sinking of the charge, some of the reduced lead becomes again oxidized, when near the form, and subsequently enters into the slag. The loss of silver always naturally corresponds with the loss of lead, similar to the loss of quicksilver and silver in the process of amalgamation.

The slag from such furnaces, Mr. Gmehling states, are mostly rich in lead, and have a high specific gravity, consequently not permitting a thorough separation of the matte and lead. Such an impure slag usually contains from 10 to 20 ounces of silver to the ton, and from 10 to 20 per cent lead, whereas others, considered more or less pure, very rarely contain less than 5 ounces silver and 8 per cent lead. Another cause of loss is the old method of the Mexican smelter, who invariably makes his charges with litharge, products of furnace, rich in lead and slag, as it is transmitted from one generation to another, and entirely ignores the usual addition of proper fluxes as practiced in other countries. Iron and lime are considered by him articles of luxury, and it would undoubtedly be extremely difficult to persuade him to add fluxes to the ores, which seems to him entirely unnecessary.

Such mode of reduction is generally applied in Mexico, oftentime making the charges without in the least considering the character of ore to be treated. These smelters therefore always produce a large quantity of matte, even at times exceeding the production of bullion whenever sulphide ores are submitted for reduction. Old slags, as well as those of recent date, are usually considered as a universal solvent for whatever character of ore, and very liberal they are with the use of the same, although every smelter ought to be familiar with the fact that the loss of metals increases with the amount of the resulting slag.

These old and new Mexican slag dumps have therefore considerable quantities of lead and silver stored up, which could likewise be said of the tailings of their "patios;" and the time may not be very distant when capital and science will unite to origiuate suitable enterprises to utilize all this wealth, which is often met with in many parts of Mexico A final success could not be questioned, Mr. Gmehling thinks, as similar ones are now being carried on, yielding large profits, with the old slag and ore dumps in the once classic Greece—the so-called ecvolades of the ancients of the Laurian mountains.

THE approximate earnings of the Mexican Central Railroad for December were $305,000. The subsidies collected to date are $3,045,914.

Gypsum.

Gypsum has been found in many places in California, Nevada and Utah. The heaviest deposits of this mineral in California are in Los Angeles county, where it occurs in beds scattered along the foothills from Caliente to Long Tom, some twenty miles or more. The deposits are of good quality and abundant. It is found also at Point Sal, Santa Barbara county, in great abundance. The deposit has been worked for some time. Other places in California are as follows: San Diego county, along the banks of Carizzo creek, and on the slope of the desert; Tulare county, at the vein of stibnite in crystals; Nevada county, near the Truckee Pass, in beautiful stellar radiations, from half of an inch to three inches in diameter. Fine specimens are brought from the Ojai Ranch, Ventura county. It is found also in the mountains of the Arroyo Grande, San Luis Obispo county. The following localities are represented in the State Museum: Lockwood creek, Los Angeles county; Monterey county; near Breckenridge, Kern county; near Hill's Ferry, Stanislaus county; Posa creek, Kern county.

In the manufacture of hay salt, extensively used on the shores of San Francisco Bay, and described in the second annual report of the State Mineralogist, sulphate of lime (gypsum) deposits from the sea-water in the tanks. This deposit at the works of the Union Pacific Salt Company is estimated by Mr. Winegar to be over 1,000 tons per year. This could be gathered, ground, and washed to remove the salt, in which condition it would be valuable to sow on the lands as a manure. It is a question if there is another locality where so large a quantity of a valuable fertilizer would remain so long unused. At the other salt works the same material forms in proportion to the quantity of salt produced.

Heavy beds of gypsum also occur in Nevada. The mineral is also abundant in Arizona, at the following places, deposited in thin horizontal sheets: In Yavapai county; east of the Rio Verde, about 50 miles north of Camp McDowell; in the pine country east of the Verde settlements; on the Gila river, 25 miles from San Carlos, Pinal county. There it is abundant and white as snow; in the Chiricahua mountains, southeast from Cabesa Peak; on the headwaters of the San Pedro; on the plains of Yuma county; in Mohave county, 18 miles southeast of Santa Maria placers.

In New Mexico extensive bodies of gypsum occur. Rio Arriba, Beruallilo, Socorro, Grant and Valencia counties have large deposits. At Socorro extensive beds occur. The lack of market renders most of these deposits worthless. Gypsum occurs in large beds throughout Montana, and in the Dakota Black Hills. None is mined there yet. In Colorado heavy deposits of gypsum have been found in South and Middle Parks and several other places.

It is curious, that notwithstanding there are so many deposits on this whole coast, most of the gypsum ground into plaster of Paris is imported from abroad. The importations into San Francisco have run down, however, from 19,000 barrels in 1874, to about 4,000 barrels in 1884, owing to the considerable product in California. The principal use of gypsum is an agricultural one. The land plaster, or ground rock, is applied as a top dressing to the soil. A fine grade is used for making casts, models, etc., and a commoner kind for making cornices, friezes, and other forms of interior decoration.

THE SILVER CONVENTION.—The Denver Silver Convention will convene on the 28th inst., when all questions concerning silver will be fully discussed by the representatives. All producers of silver bullion are interested in the result of the deliberations. The discount on silver has become so marked that many mines that would otherwise be profitable are now no longer so, and it behooves silver miners to see that Congress does not legislate adversely to the silver interests of those regions which produce the metal.

THE astronomical day that began at noon, Wednesday, was only half a day, and at its end, the hands of the great twenty-four-hour clock at Greenwich, were turned to begin anew. A corresponding change was made at the other observatories throughout the world.

A Notable California Invention.

Out of some 10,000 inventions which have been patented in California, nooe has worked a greater revolution in any branch of trade than the Spauldiog insertible saw-tooth, which has for some twenty-five years been used in saw-mills all over the coast. In November, 1882, Mr. N. W. Spaulding patented an improvement, and tho pateot was re-issued in April, 1883. This now form kept the merits of tho old tooth, but overcame what had been conceded to bo objectionablo features. This improvement has not been reached at a single bound, but rather by an extended series of practical tests and experiments, which have required patience and perseverance, besides a large outlay of money.

Ths cutting bit is placed iu a bit-holder and there firmly secured, and is adjusted and removed with the greatest facility; and, when adjusted, its staying qualities are such that nothing oan displace it, except the tool made for tho purpose—save accidents which no saw tooth could resist.

Ths bit-holder is firmly secured to the plate of the saw after the plan of the original patent, which safely protects the plate from cracking, there to remain intact until worn out.

It is so constructed that the cutting edge of the tooth is so far removed from the plate of the saw that tho greatest wear comes on the bit holder itself, thereby protecting the plate, more particularly that part immediately back of the tooth-point. This of itself is a great desideratum, it being a well-known fact to those who havo used the ebisel-bit that the plato of the saw immediately back of the tooth becomes very soon worn so thio that the socket holding the bit is thereby seriously impaired, rendering the saw unsafe for further use until cut down and the teeth or bits resot. Maoy saws have thus beeu spoiled by the wear of ooe season, while oone have escaped serious injury.

In the old tooth the sockets became gradually enlarged, and oot uniformly, so that great skill was required to set new teeth in the sockets.

This serious defect in the nse of insertible teeth has been entirely overcome by the new invention. The bit-holder, when once secured in the periphery of the saw-plate, as described, requires no change or removal, but remains as enduring as the plate itself. They are so constructed, as may be seen by Figure 1 of the accompanying eogravings, that they may be used iu any saw having Spauldiog's No. 1 teeth. If the sockets are badly worn it will be only necessary to trim the saw on the rim aod renew the socket, to securely fasten the bit-holder. The cuts show the hit-holder, the bits and keys.

Figure 1 is a perspective view of a hit-holder, full size, and exactly corresponding with the body of one of the No. 1 saw teeth, showiog the socket for the reception of the cutting bit and key; also the notch correspondiog with the lug in the groove of the bit holding io its place and preveuting auy endwise movemeot. It further shows a round notch or half hole io the upper back part of the hit-holder, into which, when the key is adjusted, there is a small copper rivet passed aod headed down. This securely holds the key in place. The round hole shown in the upper back part of the bit-holder is for the purpose of attaching the tool, which throws in and out the sliding key.

Figure 2 shows the cuttiog hits and keys. The first shows a hit, the groove and fixed lug in and across the groove. This lug corresponds to and fits ioto the notch in the bit-holder when placed in positioo, aod constitutes one of the means by which the bit is securely held in place. The second cut in the group, immediately below the hit above described, shows a key which slides into the groove below the hit, securely fastcning it in position. The second and third cut show the under side of a bit aod key, with the tongue and groove upon their meeting faces, calculated to prevent any side-wise movement of either hit or key, and ties them together.

These bits have been used in various kinds of timber in different localities, where they have been well and fully tested, botb as regards the streogth and permanency of their fasteniugs as well as to tbe amount of lumber a set will cut. As regards tbe former they have been found to be entirely satisfactory; as to the latter, a set of hits have cut from 150,000 to 200,000 feet, depending largely upon the kind of lumber sawed and ths treatment they have received at the hands of the user. They may bs resharpened with a very fine file, or an emery wbeel. The insertion or removal of these bits is easily accomplished by the use of a small wrench made for the special purpose, and is attached to the bit-holder at the small hole in the upper back part. This work can be dono by any inexperienced person, and when the teeth are once put in place they are ready for use, and are just as easily extracted.

Figure 3 shows a full-size bit-holder, with cutting bit and koy in position, fitted and ready for use. It will be observed that the cutting point of the bit, as represented in the figure, is 3¼ inches in a direct line to its support in the plate of the saw, by the virtue of which the

Fig. 1.

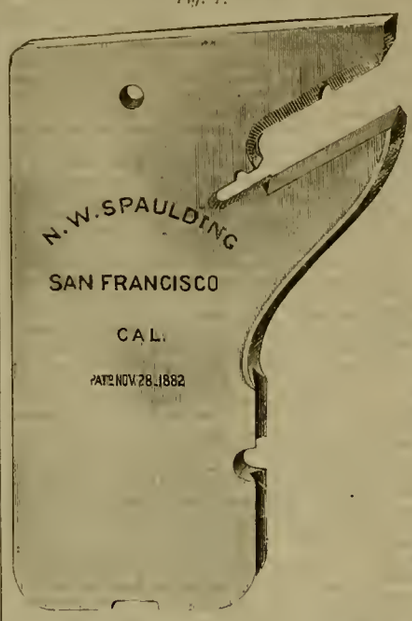


Fig. 2.

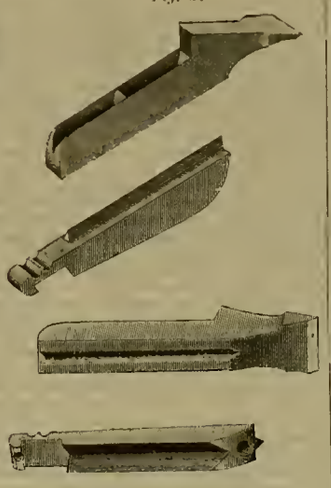
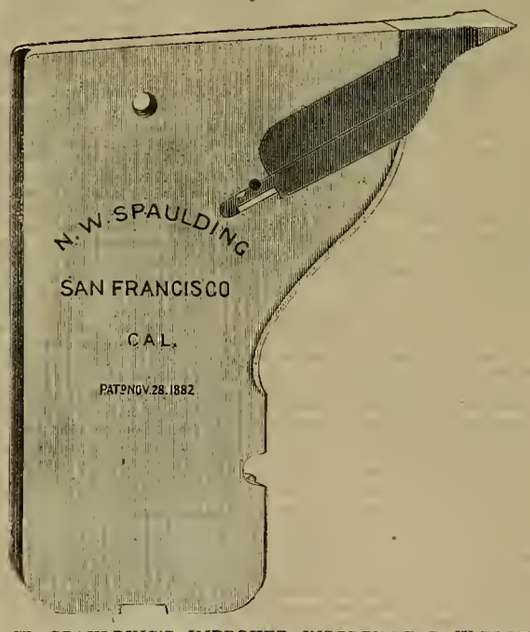


Fig. 3.



N. W. SPAULDING'S IMPROVED INSERTIBLE SAW-TOOTH.

friction engeodered by the saw-dust is received upon the bit-holder instead of the plate of the saw, as is the case where the cutting bits are placed io close proximity to the plate. Again, the angle in which the cutting point is presented to the timber makes it a free and easy cutter; also, the large open throat afforded by this device enables the dust to be discharged perfectly free in all kinds of timber. These are poiots which must be recogoized as indispensable to the well-working of a saw.

Mr. Spaulding has favorable writteo evidence conceroiog these teeth, from practical saw-mill men all over the coast. The general testimony is, that the lumber can be cut, at a cost for bits, for about one cent a thousand, when directions have been complied with. All seem to agree that a great saving of power is gained iu usiog these bits, increasing the capacity of the mills, in many instances, to nearly ooe-fifth, besides a great saving in the matter of skilled labor. This is another example of a California iuveotion, which has created a revolution in its special branch, and which is in the hands of proper parties to make it a success. In order to extend the manufacture of these saws, both here and in the East, Mr. Spaulding has associated himself with Mr. B. F. Weston, of Oakland, a gentleman of large and varied experience, in the manufacture of lumber in Michigan, and they have incorporated the business under the firm name of the N. W. Spaulding Saw Company.

Regenerative Methods for Copper.

At Oker, in the Hartz mountains, a combinatiou oi different methods is resorted to in the treatment of copper mattes. The ground matte is salt-roasted, but owing to its richness, the chloridation is of necessity imperfect. The oxides formed are, however, extracted, first, with the protochloride of iron liquor from a previous operatiou, aod second, with dilute tower acid; and third with dilute sulphuric acid, 2½ weigh cwt. of chamber acid diluted to 12° Beaume and heated to boiling, being left for ten days on a five-ton tank charge of partially exhausted ore. The precipitate resulting from the first leach liquors is pure; that from the second aod tbird unfit for the direct production of ingot.

At Alderly Edge, England, an ore occurring in a bed of sandstone carrying a small percentage of coppsr, as oxide and carbonate mixed with phosphate and arseniate of copper, has long been treated with dilute hydrochloride acid.

In this case the copper solutions being arsenical, are purified by the addition of protochloride of iron, which is said to precipitate the arsenic as an arseniate of iron, with the production of some free hydrochloric acid. After precipitatiou of the copper the solution, containing chloride with somo perchloride of iron, is concentrated to a specific gravity of 1.4 per cent, and sprinkled over a reverberatory furnace-sole covered with red hot saud, whersby free hydrochloric acid is generated, to bs condensed in a tower and used for leach liquor.

The action of sulphurous acid as a solvent wheo oxidized into sulphuric acid is well knowu. Its indirect action as a reducing and acidulating agent has beeu noted by Mr. James Douglas, Jr., in his article on the humid metallurgy of copper, in "William's Mineral Resources, when describing Zoppi's treatment of the Agardo solutions. This reaction has been taken advantage of by other copper workers and is made the basis of several regenerative methods:

At Agardo, where the leach liquors are run from the vats directly into opeu precipitating vats, the consumptiou of iron was 3.27 to ooe of copper, the cement contained so much basic sulphate as to be unfit for refining. To prevent this, Zoppi, in 1876, treated his leach liquors with sulphuric acid in a suitable tower before precipitating the copper, and as a result reduced the consumption of iron to 2.55 parts to one of copper, and obtained a current fit for the refining furnace.

Foundry Notes.

Business continues quite dull at the foundries aud machine shops, as it has beeo for some months. As comparatively little mining machinery was made here during the past summer, owing to general business depression, the foundrymen are anxiously looking forward to the opening of spriug, in the hope of au improvement in that line. It is expected that a number of mines that needed plants will be supplied this year.

The Risdon Iron Works have completed shipped and set up the new hydraulic machinery for the Comstock. They have had on hand some months the big contract for wrought iron pipe for the Spring Valley Water Company, which has made them exceptionally busy. They have finished and shipped a large mill to be put up in Fresno county for French capitalists. Most of the heavy castiogs were got to the mines before the rains set in, and very little more of the machinery remains to be taken in.

The Pacific Rolling Mills have beeu shut down for a general overhaul. The forge only has been at work on two large crank-shafts. One of them is for the U. S. S. Adams and the other is for the new steamer being built at the Potrero.

At the Union Iron Works shipyard, at tho Potrero, a propellor, 250 feet long, is being built for the Newport Coal Company, as a collier to run to the Coos Bay mines. She will be of about 1,000 tons burden, and will be entirely constructed in all details at the works. The *State of California* is also at the yard, getting in new boilers aud undergoiug a general overhauling. The steam shears used in lifting out her 80-ton boilers are capable of raisiog 100 tons. They were made at the works. They launched from these works this week the new iron caisson for the dry-dock at Mare Island, to which we have before referred in these columns. The dimensions of the caisson are as follows: Length, 81 feet; beam, 18 feet; depth, 16 feet to top of keel, or 17½ feet in all. The interior is divided into compartments, and carries centrifugal pumping machinery. They have been at work on this caisson for some six months. It is operated in the usual way, as a movable gate for the dry-dock.

THE IRON INTERESTS OF THE SOUTH.—Fully 80,000 tons of Southern pig iron have beeo sent into the East direct from the Southern furnaces. Indirect shipments via Cincinnati, Richmond and other distributing points, must materially increase this total.

THE STATE OF NEW YORK.—The State of New York comprises one-tenth of the population of the country, and accomplishes one-sixth of the manufacturing, and one-quarter of the trade. It is truly the Empire State of the Union.

THE work of enlarging the Dismal Swamp Canal, in Virgioia, so as to make it a veritable ship canal, will begin early in the new year. Six years is the limit fixed for its completion.

A Master Mechanic on Industrial Education.

Mr. W. B. Ludlow writes to the Oakland *Tribune* as follows: I had the pleasnre of visiting the mechanical school, under principal T. O. Crawford, at the Lincoln School, in this city, and was surprised and gratified to find the progress the boys were making in practical mechanics. Some of the work was as well put together of could be done by many of the mechanics working at the benches in our shops, and here comes the solution of the question, "What shall he done for our hoys?" Let them acquire a knowledge of some one of the mechanical branches of industry. Give every boy a trade; it will cost nothing to keep it if opportunities should offer in his future career to engage in other and more profitable employment. Teach him that to labor by the hands is as honorable and respectable as to be employed as clerks, hook-keepers or salesmen, or in any of the professions. Let him learn that this is a practical age; that the railroad president is greater than the senator. The engineer and machinist throws the theorist and the vague philosopher in the background, because he deals with material facts. The great scientist of the age must reduce his science to a practical theory of facts, and the man who makes your shoes is of more value to mankind than the expounders of vague and unpractical theories of all kinds. Position and a competence, influence and the esteem of his fellow-men, are the rewards which the world pays to the man that can supply its wants. We want better mechanics, and the brain, the eye, the hand must he educated to attain this end. We must give our hoys an education that will enable them to make a living with their hands; establish technical schools that will enable them to go from the school to the workshop skilled in the particular trades they have selected for themselves. How can we do this? Norway, Sweden, Russia, Germany, Holland, France and England are doing it, and what is

A Startling Fact,

Are filling all of our large shops and factories with skilled foremen for the American hoys to work under; or they go through a high school course and content themselves with a position as clerk, book-keeper or a place in a store, working a full year for a year's hoard and lodging, never aspiring to a home, and, if they marry, keeping their wives in a third-rate boarding-house, and their children—well, God help the poor children! It would be better if we cannot accomplish it in any other way, to abandon the bigb school altogether and establish in its stead a tecbnical school where the pupils who graduate from the grammar school could enter for a term of instruction in the industrial branches of mechanics, and learn a trade so they could master it, and pursue at the same time a higher course of English studies than can be obtained in the grammar grades. If we do not do something of this kind, where is a hoy to learn a trade? The following from one of the daily papers of recent date, hits the case exactly: "When old Stephen Girard, of Philadelphia, died 50 years ago he left the bulk of his fortune for the establishment of a college where poor white male orphans were to be furnished an education until they reached an age when they could be bound out as apprentices to useful trades and occupations." Within the last ten years it has heen found more and more difficult to follow out the provisions of the dead millionaire's will.

The Great Trades Unions.

Have so entirely rooted out the apprentice system that there is nothing left of it. In this emergency the directors of the college have established technical schools on the model of the English schools, in which lads are taught various handicrafts, and with such success that many lads of 16 have gone from these schools directly into factories and obtained good wages. The system is worthy of adoption in other schools, as it is becoming more true every day that the man with a good trade has an immense advantage in practical life over the ordinary college graduate.

Even if you apprentice him to some trade, he hut learns a part of it. If in a machine shop he is put to work on a lathe, and there he remains until he is ont of his time, and he becomes a lathe hand, or if in a factory he is set at some special part of the work, in which he soon becomes skilled, and is kept at it because he is able to earn something for the concern, and when he is out of his time he is

A Specialist, and Nothing More;

He could not superintend that machine shop or factory no more than he could fly, hut make a hand to work under the direction of some one educated in the technical schools of Europe.

Remember, the cass of our nail factory—skilled labor had to be imported, and then made their own terms, among others that no apprentices would be taken.

So if the trades unions will not let the boys learn, and the owners of our large industries will not take an interest in them, the Government must.

I believe in education and in our free schools and am proud of Oakland's pre-eminence in her schools. I feel it is the duty of the Government to give every child on American soil, no matter what its condition or who are its parents, a thorough education in reading, writing, arithmetic, the English grammar grades, and a trade. I understand the importance of an education to the youth of the land and the relation it hears to the perpetuity of the American Union and its free institutions in the future. But I also see that with our present system of teaching ths hrain and filling the ranks of doctors, lawyers, educators, hook-keepers and clerks to overflowing, and for whom Europe has no room, we are injuring ourselves while Europe is teaching her sons the art of industrial mechanics, and doing it well, sending them to our shores and driving our sons from the positions that are naturally theirs to the professions, or which is more likely, to the lowest menial employment. We will have to look this problem squarely in the facs; it is upon us, and for the welfare of our children we must move swiftly and firmly in the right direction.

Who Made the First Flannel?

At various times the question has come up, Who made the first flaunel in the United States? But it has never been successfully answered as yet. That it was made on hand-looms, and home spun, there can be no doubt. And, as it was not necessary to send such flannels to any mill to be finished, it will he at this late day difficult to trace out who was the original maker of this material. "Away down East" it used to be common to make and use what was called there "woolen sheets." They were home-made, the yarn, both warp and filling, being hard-twisted, and, when woven, they were simply washed out and worn in that condition, there being no nap raised on them. But the question now is, "Who made the first flannel?" and in reply to this query a cotemporary says: We once received the following reply from an old "veteran." But it is possible that some of the old stagers in the commission business may throw more light on this question.

Now it is in the memory of people living in and around North Andover, Mass., of a certain old lady who came to this country from Rochdale, England, sixty years ago or more. She went hy the name of Dolly Howarth, and, if my information is correct, she was the first to weave a piece of genuine wool-flannel in New England, if not in America. If such be the case, I think it is nothing hut right and just to her memory that the credit he given to her, and be recorded in the archives of Massachusetts. She had a grandson living a year or so ago, and he may be living yet. His name is Andrew Howarth. He has heen connected with flannel manufacture all his life, and the last the writer heard of him he was running a flannel mill with his son in Vermont somewhere; I think in Northfield, but am not sure. If Mr. Howarth, who is now getting along in years, could be induced to write what he knows about the matter, I think he could throw considerable light npon it. Mr. Howarth has been in every branch of a flannel mill, from a card boy up, and I suppose is at present the oldest practical flannel maker on this continent, his first lessons being taken in North Andover or immediate district. The writer worked for him more than a quarter of a century ago. If it is so, that a woman made the first piece of flannel in this country, let it be known from one end of the continent to the other; if not, let us try to find out who did.

PRISONERS IN RUSSIAN MINES.—Where prisoners in Russian mines conduct themselves well they are sometimes permitted to live in small houses near the prison after two or three years' incarceration. This privilege is accorded most frequently to married men. Presentations of clothes are often made to help them along. The convicts consist mostly of murderers and robbers, but a very small proportion being political offenders. These latter scarcely ever work in the mines, being kept in a prison apart from the others, and possessing more comforts. The laborers are not at all in harmony with the Nihilists or their principles, and they are kept apart more for the sake of peace than for any other reason. This is the only gold mine in Siberia in which convicts are employed. Ahout 1,000 of them are worked in some of the silver mines, under the same conditions as govern the others. A working day usually consists, in summer, from daylight to dusk—6 A. M. to 8 P. M.—with two or three hours intermission for meals. The work of each one is marked out hy the superintendent, and the diligent and expert miners are allowed to go home as soon as their daily allotted task is finished. Very little is done in winter on account of the extreme cold and short days, during which time the convicts do not work at all.

FORMERLY THE LAKE SUPERIOR MINES controlled the copper trade of this country, but the discovery of great deposits of copper in Arizona within the past few years has changed all this and the stocks of the Lake companies have been seriously, if not permanently affected thereby. The attempts on the part of the latter to discourage western production by deliberately knocking down the price of copper have utterly failed and their own shareholders have been the principal losers. It is known that the Arizona ores contain a percentage of copper so much greater than those of the Lake Superior mines that the western producer, though a greater distance from market, is able to compete successfully with his rival of the Lake region.

Mining.

Says the Salt Lake *Tribune:* It is only fair to give honest credit where it is due. The times are hard, hut still the hig theater is thronged nightly, and the merchants who deal in holiday goods, all report a wonderful trade. These things require a good deal of money. There is but one source it could have come from this year. That is the mines. In wages, in payment for supplies, and in freight, they have distrihuted among the people a heavy percentage of their output. Except for them, a general paralysis would be upon every hranch of business in this region. Men should make a note of this, and when they look up from the smiling valleys to the hlue hills beyond, they should keep in thought that the hills have quite as warm hearts for the people as the valleys. We have often asserted that the only really legitimate business of this region, at present, is mining. We hold that the present situation is conclusive proof of the truth of this statement. The miners need fuel, and the heavy trains are set in motion to supply them. It requires men and fuel to run the trains; it requires other men to mine the coal; the silver mine pays all the expenses. The machinery of mill and hoisting works wears out or hreaks, and the forgers at once start their red fires to supply the want; the silver mine pays for it. The miners give up thirty-three per cent of their earnings for food. Boarding-house keepers seize upon this, and with it buy of the farmers their products. The mine pays for all. So it runs down through the whole list. The fountains from whence all the streams of money flow are the mines. And they are not like any other customer. There is no harter in their payments. For everything they pay in gold and silver is no drain upon the world's hoarded wealth, for the mines create it. If there was just food enongh for the people here, and some merchant was to hring in as much more, the result would be a fearful breaking down in prices. But if suddenly a new mine were to be opened, there would he more machinery, more men, more houses, more teams, more fuel and food, and the find would touch with a new thrill every channel of trade. That is the difference between mining and every other kind of husiness. That is where the inestimable blessings of paying mines are seen.

SILVER MINING IN RUSSIA.—Silver mining in Russia is not profitable, and is carried on hy the Government, principally for the purpose of giving the people work. The ores are mostly galena in character. Oxides and carbonates are found in some parts of Siberia. As a rule, the silver with lead ores is not rich and rarely assays over $50 a ton. The shafts are seldom very deep, rarely exceeding fifty feet. The machinery is very primitive, and is mostly worked hy horse-power. There is very little steam machinery. In consequence of these crude materials for working ores hut a small profit is yielded. There is only one five-stamp mill in the country for quartz ores which contain some free gold. That is in the Altai mountain mining district. In the Ural mountain gold-mining district crushers are used for the gold quartz. The entire gross yield does not exceed more than half an ounce per ton, or about 1,000 pounds per year. There are very few regular silver veins. The ore is usually found in pockets, and there are plenty of them. After going thirty or forty feet helow the surface the hottom usually drops out. In the Altai mining district there are some shafts in silver mines 400 feet deep, hut deeper sinking is impossible, on account of the weakness of the pumping machinery. Sometimes pockets are found which cover a surface of 25,000 square feet. Lodes are generally found 500 or 600 feet long. There are no private corporations handling silver mines, on account of their small yield as compared with gold. There are only a few of such organizations, composed entirely of Siberian capitalists.

GOOD BRICK.—There are excellent brick now being made at Bullionville. The brick is of a cream color, four inches broad and eight and a quarter inches in length, two and a half in thickness, and weigh five pounds. They look like the Milwaukee brick. These brick are made from the water clay, hy William M. Roberts, of Provo City, Utah, who uses a Sword & Son's steam-power press. The brick are not burned, hut are set out and dried hy the sun, or in the heating room. They are solid and have a clear ring when you tap them. They are the best and most durable brick we have ever seen in this country. Those who have seen the machine work at Bullionville say it surpasses any brick-making machine they have ever seen.—*Pioche Record.*

FOUL SMELLING GASES.—The men who are at work in the drifts on the 2700, 2500 and 2300 levels of the Union Consolidated mine are just now a good deal troubled with foul-smelling air or gases. As the water rises, so also rises a large and very able stink. This is about the same thing as a "stench," but is rather more robust and capable. This bad smell appears to be a combination of the dissolved powder smoke from the walls of the drifts, the rancid grease cooked and set afloat from the engine and pump stations, and the dead and foul gases forced out of chinks and fissures in the rock by the rising water. This foul air is not dangerous, but it is described as abominably nasty.—*Virginia Enterprise.*

"Missing the Paper."

Subscribers vs. Publishers.

Naturally, every subscriber wishes and expects to receive the paper he subscribes for regularly and promptly. A failure to get a copy of any one issue is certainly aggravating to one interested in the contents of his favorite publication. However trifling the loss may appear, it is a matter of considerable importance to him. As a general rule, no blame attaches to the mail service. Its arrangements for transmissions and delivery are excellent and deserving the highest encomium. To those few subscribers from whom we receive complaints, we say the reason must usually be found somewhere else. It may be taken for granted that all papers, which should be mailed, are forwarded from the office promptly at the proper time. To err is human, and mistakes will occur, but it would be unreasonable to suppose that they will occur repeatedly to the same subscriber. Years of experience has enabled us to adopt a system in the mailing of our publications almost perfect in its every detail, and our readers must certainly recognize the fact that it is to our own interest to see that they get their papers promptly and regularly. There are causes, though, which are beyond our control. One cause is the illegible manner in which some send in their address; sometimes agents or others write the names wrong. Although many of the postoffice employees rival Œdipus of old in the solving of riddles, there are many instances where even their keenness fails to grasp the incomplete directions furnished by subscribers, and, of course, copied by the publishers. Write plainly your *full* name, street and number, town and county, and in most cases we will guarantee you will experience no disappointment.

Then instances are known in the cities where parties, leaving early in the morning before the delivery of the mail, have locked their rooms and remained away all day. That losses may occur in such cases is certainly not surprising, for the postman has performed his duty when he leaves it at your door.

For instance there are often two John Smiths or Thomas Browns in the same town, the same ward, or on the same street. If the paper is labeled J. Smith, and it sometimes goes to John Smith, and at other times to James or Joseph Smith, John will declare his name is all right on the list, and the publisher only sends it half the time.

Before denouncing the publisher (who, on succeeding in getting his papers to 999 subscribers out of 1,000 promptly, is more anxious to get it to you regularly than you are to receive it), inquire pleasantly, but persistently, at the P. O., and of different persons, at different times, if more than one is in the habit of handing out the mail. Make sure that the delivery clerk understands the correct pronunciation of your name and its proper spelling. Sometimes the mail for Knight's Ferry goes to Knight's Landing, and in two or three days finally gets to the right place.

Generally, when a subscriber will write directly to the office his full address, and state plain facts about missing numbers of his papers, the difficulty will at once be remedied, missing numbers remailed, and the papers received regularly thereafter.

But it is not always a case for us simply to print the name and address correct on every issue of the paper, and put it carefully in the P. O., and pay the postage.

If we cannot get the paper through O. K. after a first notification, do not make the atmosphere blue in the neighborhood by denouncing the faithful publishers—a thousand safe miles away from you, perhaps!—but use the better and less exhausting method of writing a second letter or postal card. This will make us feel worse, because it brings the matter so much nearer home. A council will be called, including the manager, chief subscription and mailing clerks. If the subscriber has a foreign name, sounding peculiarly different from what it looks in English print, we have hopes that the P. M., in a little time, will get the name, the man, and the paper associated together in such a way that he will receive his copies as regularly as they are issued.

If the initial is C, in an odd name pronounced, as if beginning with K or S (as Croft *vs.* Kraut, or Center *vs.* Senter), we may confidently hope that the P. M. will finally learn to look in the C box and deliver the paper, instead of saying "it hasn't come."

There are so many Eurekas in California and Nevada that we have had to print extra explanatory words on some labels. One time "our council" made the discovery that there is a "Columbia avenue" and two "Columbia streets" in S. F., and one or more J. B's and J. S's live on every one of them. So when we, for instance, make the address, "John Jackson Brown, Tailor, No. 24 Columbia street, off of———street, between———and——— streets, San Francisco," J. Brown gets his paper every time, and all are mutually happy after that. They giving the full name and occupation often makes the delivery O. K.

With papers directed to the halls, when societies meet in the evening only, we have had a great deal of trouble; and some janitors, threatened with losing their situations, have begged and promised to be more careful hereafter about leaving the papers about the hallways, etc.; but we know that will not cure the evil. Have the paper directed to some officer or person who is in his place during the entire day, and the trouble will be cured.

A little less difficulty arises when the paper is sent to an office where there are several desks, and the subscriber occupies his only an hour or so a day; or when the paper is sent to a shop or store where there are several partners; or a boarding house where several persons of similar names reside.

Green hands in the postal service may, for a time, stand in the way of correct transmission. We cannot name all the difficulties, but believe the above-mentioned are the most frequent.

It is a singular fact that more complaints arise from subscribers who take monthly publications than semi-monthlies, and semi-monthlies than weeklies. This may arise from the fact that weekly subscribers call more frequently, and always at about the right time for their papers.

We sincerely regret that a single patron should have occasion to complain, but before censuring us we urge them to weigh well all the possible causes, and see first if the fault is not their own. We will always endeavor to make good all missing numbers, and cheerfully rectify all errors that may have occurred at this office. In other words, subscribers not receiving their paper regularly are requested to report at once at this office, mention the numbers missed, when their cases will receive prompt attention.

Technical Education in England.

A conference of representatives of trades unions with members of the Artisans' Technical Association was held at Anderton's Hotel, Fleet street, under the presidency of Sir Philip Cunliffe-Owen, C. B., to consider the best means of placing before artisans the important work in which the association was engaged. The Rev. H. Solly, a Vice-President, stated that the association was established three years ago, to enable artisans to promote technical knowledge and handicraft skill among their fellow-workmen, and to aid them in submitting their views and experience concerning technical training to government departments, public bodies and associations of artisans. He held that it was especially incumbent upon trades unionists to maintain a standard of workmanship as well as a standard of wages, and to this end it was desirable that they should co-operate in the formation of technical classes near workmen's homes, which would supplement the instruction given in the large central institutions where technical instruction was given—such, for instance, as the Polytechnic Institution. The Chairman said international exhibitions—which he likened to battlefields of human industry—had shown that Englishmen were no longer superior to foreigners in certain trades, and that the latter, by means of facilities for technical education by which they profited, were enabled to compete successfully with British artisans. He eulogized the trade syndicates which existed in Paris, consisting of employers and employed, whose object was to improve their manufactures and advance their mutual interests. Each syndicate made a report in the form of a small printed book, and, after much difficulty, he, in 1878, procured copies of several of these books, translations of which might be usefully circulated among British workmen. Means might not be readily obtained for providing special class rooms, but employers might consent, after business hours, to afford accommodation in their establishments for technical classes for the benefit of their own workmen and others engaged in the same particular trade. Further, he thought that employers might be disposed to contribute toward the payment of the teachers and other expenses. He was anxious that the work of British artisans should continue to speak for itself by its inherent excellence, as it did at the international exhibitions of Paris and Vienna, and, as he confidently believed, it would speak again at the Paris Exhibition of 1889. After some discussion, it was unanimously decided to request the trades unions of the United Kingdom to assist the association in its efforts.

THE NEW LIME COMPANY.—The California Lime Company, which has undertaken to develop some immense and very superior lime ledges that crop out of the hill side of the North Fork canon, a short distance above Clipper Gap, are making very satisfactory progress with their work, and by early spring expect to have everything in readiness for burning and shipping lime on an extensive scale. The work at present is under the superintendency of Mr. W. P. Murry, who, from his energetic disposition and experience, seems to be an excellent man for the place. From the site of the proposed kilns to Wildcat Station, a point about half way between Clipper Gap and Applegate Station, where it is proposed to put in a switch and side track, the distance is about two and a quarter miles, and the grade up which the lime will have to be hauled will not exceed ten inches to the rod. The new road between these points is now more than half finished, and being pushed ahead as fast as the weather will permit. The company proposes to build four large patent kilns, the foundations for which have already been commenced. The ease with which the rock can be quarried, and the facilities for obtaining cheap wood, coupled with the great advantage they will have by reason of being so close to the railroad, will enable this company to supply the demands of the coast for lime at a price with which it will be difficult for other manufacturers to compete; and in addition to all these other advantages their lime rock is very superior, insuring of course a superior quality of lime. The company is strong financially, and composed of successful business men, and the indications are now that they will make this one of the big enterprises of the county.—*Placer Herald.*

THE NORTHERN COUNTIES.—Under this heading the Marysville *Appeal* says: "Immigrants are arriving in this State at the rate of from 1,000 to 1,500 per week, and a fair per cent of the number are looking to the northern counties for lands and future homes. No pains are being spared to send all the assistance possible to the people who seek new homes in either Yuba, Colusa, Butte, Sierra, Plumas, Tehama, Lassen or Modoc counties. There are fair lands to be found in all the foothill counties, but they should be pre-empted by young men of energy and small capital. There are fair lands for sale in Colusa and other counties, which can be had at low figures, and which will make the owners rich in twenty years hence. Heretofore Southern California has had the monopoly of the immigration to this coast, but the tide is turned, in a measure, and Europeans and Eastern people are looking at the open lands in the northern counties."

USEFUL INFORMATION.

PINE WOOD SHAVINGS are being more and more largely utilized in Europe for stuffing purposes. At Pesth, in Hungary, a large factory is exclusively devoted to the production of such shavings which latter, by the aid of machinery, are reduced to such a degree of fineness that the resulting product resembles tow. Pine wood shavings are claimed to be superior to every other substitute for horsehair in connection with upholstering purposes, whether as regards elasticity, softness or durability. For bedding, such shavings are recommended by reason of the resin contained in the wood being an effective preventive of vermin. The German Ministry of War, has tried the material for bed-stuffing purposes, and has expressed its high approbation of its merits both for hospital and barrack use. After having been used as stuffing for five or six years, the shavings can be renovated by being exposed to the heat of the sun, or to a heightened temperature. As regards wear, pine shavings are said to compare favorably with horsehair, while the cost is naturally far smaller.

AN EASY TEST FOR LUBRICANTS. The manager of any mill may, at very little expense determine for himself all the conditions of safety and economy in lubricants as indicated by the standard of heat developed upon any given shaft. The apparatus required for this purpose is merely a thin brass tube closed at the lower end, and two thermometers. The method of using this apparatus is as follows: Place enough water in one of these tubes that the bulb of the thermometer will be immersed; insert the tube in one of the holes in the cap of the journal, so that the lower end of the tube will be in actual contact with the shaft, hang the other thermometer free alongside; then gauge the relative heat developed with oils and with greases. Each man may thus satisfy himself as to which is the best and the safest.—*Ex.*

THE USES FOR COPPER have greatly increased, and hundreds of things are now made of copper that were formerly made of chesper metals, or not made at all. The rapid progress of electrical inventions has required an immense consumption of copper for electrical machinery and lighting. Practical use has shown that copper wire is cheaper and more satisfactory than iron wire for telegraph and telephone lines, and the copper wire trade alone is enormous and constantly growing. Tons upon tons of wire of different varieties are now kept in stock, though only a short time ago such a thing was unknown in the trade. Immense quantities of copper are used in house hardware, water fixtures, railroad supplies, clocks and fancy goods, and it is claimed that for roofing the metal is cheaper than tin.

FRUIT STAINS.—Most fruits yield juices which, owing to the acid they contain, permanently injure the tone of the dye; but the greater part may be removed without leaving a stain, if the spot be rinsed in cold water, in which a few drops of aqua ammonia have been placed, before the spot has dried. Wine stains on white materials may be removed by rinsing with cold water, applying locally a weak solution of chloride of lime, and again rinsing in an abundance of water. Some fruit stains yield only to soaping with the hand, followed by fumigation with sulphuric acid; but the latter process is inadmissible with certain colored stuffs. If delicate colors are injured by soapy or alkaline matters, the stains must be treated with colorless vinegar of moderate strength.

BASKET-MAKING IN GERMANY.—Basket-making in Germany, which was begun in a modest way not many years ago, has developed into an important branch of industry. It employs no fewer than 39,000 people, and the ware finds a profitable market not only at home but in many foreign countries. The demand for the raw material has given quite an impetus to willow culture in Germany, and trees better adapted to the needs of the manufacturer have been introduced. About 200,000 hundred weight of willow withes are annually imported. The people of the village of Heinburg, who redeemed 300 acres of swamp lands a few years since, and devoted them to willow-planting this year realized about $1,750 from the sale of the withes to the Saxon and Wurtemberg manufacturers.

TRACING PAPER.—Transparent tracing paper is made by a variety of processes. One of the most approved methods is the following: Dissolve a piece of white beeswax, about the size of a walnut, in half a pint of spirits of turpentine; then having procured some fine, white tissue paper suitable for the purpose, lay it on a clean board, and with a soft brush dipped in this liquid, go over one side, and then turning the paper over, apply it to the other side; then hang it up in a warm place to dry. It will be ready for use in a few days. Some add a small quantity of resin, and others use resin alone.

The above method of preparing transparent paper is said to be decidedly preferable to the use of paraffine.

CEMENT FOR PATCHES ON SHOES.—The cement used in patching the uppers of fine shoes is generally made by dissolving gutta percha in chloroform until the mixture is about as thick as syrup. Scrape and pare clean around the hole to be covered, and thin carefully with a chamfer edges of the bit of leather to be applied. Only a little of the cement is needed, but the surfaces must be pressed close together. The parts will adhere firmly in a few minutes.

LEAD COATED IRON NAILS are recommended for attaching slates for roofing purposes. Plain iron nails, and also (though less rapidly) tinned or galvanized nails, used for this purpose, are found not to be very durable. The cause is suspected to be the corrosive action of sulphurous acid and sulphuric acid, resulting from the combustion of coal, which invariably contains more or less sulphur. The lead coating of the nails is suggested as an effectual remedy, as this metal is insensitive to the action of these acids.

TO SOFTEN RUBBER RINGS.—The rubber rings used to assist in keeping the air from fruit cans, sometimes become so dry and brittle as to be almost useless. They can usually be restored to their normal condition by letting them lie in water in which a little ammonia has been placed. Sometimes they need not remain more than five minutes; but frequently a half hour is required to restore them to elasticity.

THOSE who use brass or porcelain letters on glass windows know how often they drop off from unequal expansion, or from the too energetic efforts of window cleaners. They will be glad to have the following recipe: Litharge, two parts; white lead, one part; boiled linseed oil, three parts; gum copal, one part. Mixed just before using. This forms quick-drying and secure cement.

THE FURNITURE INTEREST in the United States is a very important one. Three years ago in New York it amounted to 300 factories and a product of nearly $10,000,000. Cincinnati had 119 factories, with a product of $4,500,000. Chicago turned out above $6,000,000, Philadelphia, $5,000,000, and Boston, $4,000,000.

EXTENDING OUR MANUFACTURES.—The Turkey-red damask goods which are now being made in this country are of a class which have always been imported until within two years. Only the Bates mill, Lewiston, Me., and the Renfrew mill at North Adams, are now making them in this country.

OIL CLOTH may be improved in appearance by rubbing it with a mixture of a half-ounce of beeswax in a saucerful of turpentine. Set this in a warm place until they can be thoroughly mixed. Apply with a flannel cloth, and then rub with a dry flannel.

GLASS SHINGLES are now used and bid fair to become popular. They are strong, durable and cheap.

IMMENSE numbers of paper bottles are now made and used in Germany.

GOOD HEALTH.

Waking One's Self at Will.

An old problem of the psychologists has been revived by a letter to *La Nature* written by a French business man, who mentions that for years he has been in the habit of waking himself at any hour in the morning he wished, simply by impressing upon his mind before going to sleep the fact that he must awake at that hour, and saying further that he seldom varies five minutes from the moment which he had assigned himself. We have a very distinct recollection of many instances in which we have ourselves tried the experiment with success, and at one time, when it was necessary for a considerable period for us to wake on certain days of the week at a very early hour, to take the first train to the place where our services were then needed, we had an opportunity of studying the circumstances under which this peculiar species of self-control is most easily exercised.

During this period we found no difficulty in waking regularly within about five minutes of the time necessary to enable us to reach the train comfortably, although for a portion of the time this involved getting up long before daylight; but we discovered also that in order to wake with precision at the right moment, and to rest quietly un il it arrived, it was necessary to look at our watch just before going to sleep. If we neglected this precaution we were apt to sleep uneasily, waking first an hour or more before the proper time, and allowing ourselves in consequence only short naps afterward until the minute arrived for getting up. Whatever part of our mind it might have been that took charge of waking us seemed to begin its count of the hours from the time at which we composed ourselves to sleep, and if we did not inform ourselves of this our conscious reckoning was correspondingly uncertain and the effort to wake vague, but if we took a clear note of the time in the evening we could sleep peacefully through the whole of the alloted interval, sure of being aroused at or very near its expiration. Another condition of waking we found to be the occurrence of some small external event, through which, as it were, the internal effort could take effect upon our senses. A very trifling circumstance—the flutter of a leaf outside the window, the chirp of a bird or any other of the innumbered sounds of early morning—was sufficient, if it happened at the right time, to wake us by a sort of magnifying process which at that moment gave the power of startling us by a noise which would at other times be unnoticed; but without such sensible impression we think, we should not have waked. In fact, on one or two occasions we remember to have been impressed with a dim consciousness of waiting for something to happen before waking, and a moment later a stifling sound would open our senses with a little shock To the necessity of waiting for this impression, small as it might be, we were disposed to attribute the variation to a minute or two either way from the exact moment assigned for waking, which might otherwise be kept with exact punctuality. —*American Architect.*

Heart Beats.

Dr. N. B. Richardson, of London, says he was recently able to convey a considerable amount of conviction to an intelligent scholar by a simple experiment. The scholar was singing the praises of the "ruddy bumper," and saying he could not get through the day without it, when Dr. Richardson said to him: "'Will you be good enough to feel my pulse as I stand here?' He did so. I said, 'Count it carefully; what does it say?' 'Your pulse says 74.' I then sat down in a chair, and asked him to count it again. He did so, and said, 'Your pulse has gone down to 70.' I then lay down on the lounge, and said, 'Will you take it again?' He replied: 'Why, it is only 64; what an extraordinary thing!' I then said: 'When you lie down at night that is the way nature gives your heart rest. You know nothing about it, but that beating organ is resting to that extent; and if you reckon it up it is a great deal of rest, because in lying down the heart is doing ten strokes less a minute. Multiply that by sixty, and it is six hundred; multiply it by eight hours, and within a fraction it is five thousand strokes different; and as the heart is throwing six ounces of blood at every stroke, it makes a difference of thirty thousand ounces of lifting during the night. When I lie down at night without any alcohol, that is the rest my heart gets. But when you take your wine or grog you do not allow that rest, for the influence of alcohol is to increase the number of strokes, and instead of getting this rest you put on something like fifteen thousand extra strokes, and the result is, you rise up very seedy and unfit for the next day's work till you have taken a little more of the 'ruddy bumper,' which you say is the soul of man below."—*Gaillard's Journal.*

FANCYING HIMSELF AN INVALID.—There are many persons who think they are invalids when they are not, and there are many who claim sympathy on that ground who are in no sense entitled to it. They might shake off their invalidism by exertion if they would. A little effort of the will, a little self-reliance, a little determination, and they would become well. Such persons, however, generally have weak wills and are negative characters. We knew one of them who could always be made ill by telling him he looked pale. On one occasion three persons played a joke on him to test this matter. One met him on his way to work and said: "Good morning, why you look sick this morning, what is the matter?" "Oh no, I am quite well," he replied. A few moments later the second one met him and said: "What is the matter with you, you look pale." To which he replied, "I'm not feeling at all well." The third one said: "You look as if you ought to be in bed." To which he replied he was feeling quite badly, and in an hour he quit work and went to bed sick. Yet this man lived to be very old and was never really sick, but was only so in his imagination.—*Herald of Health.*

A HUNDRED YEARS OF LIFE.—Dr. J. M. Peebles, of New York, has written and published a work entitled "How to Live a Century, and Grow Old Gracefully." The author does not maintain that every person who has been born with a defective constitution, or who has lived a life of dissipation can live a century; but that persons well born and with good habits ought to nearly, or quite, round up a life of usefulness of one hundred years' duration. In his preface he says: Human life being both the gift of God and a blessing, it is a duty to preserve it as long as possible. No truly good person, however aged, ever outlived his or her usefulness. In all enlightened lands old age is considered honorable; the hoary head is a crown of glory. In preparing the work the author seems to have aimed to be practical rather than original or elegant, bringing to mind and clearly presenting the vital importance of air, food, drink, clothing, sunshine and sleep in such varied ways as to inspire the reader with a proper and persistent use of them that the number of years upon earth may be many—even *a hundred!*

THE MODEL HEALTHY MAN.—The man who lives an idle life, be he a sturdy vagrant or fine gentleman, even if he is ever so healthy, is not our model healthy man. The pattern healthy man is one who lives long and vigorously; who in every part of his life does the largest amount of the best work that he knows how to do, and when he dies leaves healthy offspring. The healthiest country is that which produces the largest number of such men, who do the greatest variety of good work for the longest time. Of course the word man is used in its broad sense, and includes women also.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

FURNACE.—Amador *Ledger*, Jan. 3: S. D. Shugert has built a furnace for roasting sulphurets upon the Amador Queen property in Hunt's gulch. The furnace has a capacity of roasting 800 pounds at a time. Mr. Shugert is an expert in chlorination matters. The reduction works at Drytown are at a stand-still, we believe on account of the bad condition of the roads putting a stop to hauling sulphurets from the mines in El Dorado county. W. G. Anderson has made arrangements with San Francisco men to start work on the New York quartz claim, located two and a half miles southwest of Jackson. Notices are posted up calling for bids for running 500 feet further north in the big tunnel at Middle Bar, contractors to furnish powder, fuse, etc., and to prosecute the work with three shifts of not less than four men each. Bids will be received until the 5th of January. All hands at the tunnel were discharged at the end of last week. For the last 700 feet the work has been done by men employed at so much per day, but a return to the contract system has been determined upon, hence the notice for proposals.

SUTTER CREEK.—Since the heavy rains the flow of water in the Mahoney has exceeded the capacity of the pumps to keep under control. The water is steadily gaining, and fears are entertained that the mine will be flooded. A new five-stamp mill is to be built for the Iowa mine as soon as the weather will permit.

Fresno.

QUARTZ MOUNTAIN DITCH.—Cor. Fresno *Republican*, Jan. 3: On the 3d inst. the earth and rock excavation on the line of the Quartz Mountain Mining Company's ditch was virtually completed. It has been a work of great magnitude, and the completion of the excavations in so short a time through the rugged country over which the line passes is a matter of much surprise to every one conversant with the great difficulties that were to be surmounted. The line of the ditch is a fraction over 21 miles in length and traverses a section of country that is very rugged and precipitous, and covered to a large extent with a dense growth of chaparral, which required to be hewn to the ground before the grade line of the survey could be established. There are three tunnels on the line of ditch, the aggregate length of which is 573 feet. The maximum grade of the ditch is 12 feet per mile, and the minimum is 6 feet per mile. The capacity, roughly estimated (allowing a reasonable margin for loss in leakage and evaporation), is about 4,000 miner's inches. The width of the ditch, on top, is an average of about 9½ feet with slope of sides at 45 degrees.

Inyo.

FURNACE.—Inyo *Independent*, Jan. 3: There is but little probability that the furnace at Elna will be started up again soon. The property has now been in the hands of the sheriff for several weeks, and before work can be resumed all the claims against the concern, amounting to several thousand dollars, must be satisfied. The means for doing this are not very apparent. James Stansfield found a good prospect a few days ago in Black canyon. He has put men to work to develop the claim. Greenly and Broder resumed work on the Cliff mine about two weeks ago. The mine has been idle during the past year or more. Two sample lots of the ore, each weighing a ton, have been found to go, one fourteen and the other fifteen hundred dollars per ton. Thomas C. Boland has leased the whole mining property at Cerro Gordo, including mines and furnace. Mr. Boland will put a full force of men at work immediately, and all the old-time bustle and activity is likely to be seen at Cerro Gordo before spring opens.

Mono.

MILL CREEK EXIT.—Bodie *Free Press*, Jan. 3: With the winding up of assessment work in Mill creek district there is a general exodus among the boys that will nearly depopulate the camp for the winter. A party to-day consisting of Wm. Robson, Paul Rouze, Angus McDonald, Wm. Ray, R. A. Sawyer, Hugh Kennedy and the village shoemaker leave for Quartz mountain. They attempt what might be termed a perilous journey—over the Sierras on snowshoes, via Tioga Pass.

Mariposa.

BEAR VALLEY.—Cor. Mariposa *Herald*, Jan. 3: The Morning Star has been anxiously looked upon for some time past as an oasis in the desert, but from present indications it seems probable that we will have to wait a while before we receive any assistance from that source. If this mine was in the hands of the right parties, by a reasonable outlay of capital to develop it, it would no doubt become one of the richest mines in Mariposa county. The situation of the mine and facilities for working are No. 1, and the mine has every indication of being a good one if opened out. By a comparatively small outlay of money and labor a good wagon road could be built to the mine so that machinery and supplies could be shipped to it as easily as into any town in this county.

Nevada.

TO START UP NEXT SATURDAY.—*Transcript*, Jan. 4: The new ten-stamp mill of the Secret Treasure and Cornucopia mines in Washington district is almost completed, and crushing will be commenced next Saturday. There is a large quantity of rich-looking ore already out, and more is being extracted. The company will soon be among the regular bullion producers of the county.

THE ALASKA MINE.—*Transcript*, Jan. 1: Two loads of machinery for the Alaska mine at Pike City, left here Tuesday to arrive there yesterday. There are one or two more loads to go up immediately. The rock-breaker which recently arrived by rail cannot be delivered till the roads improve, on account of its great weight. A pump weighing 26,000 pounds has been ordered and is expected here this month. It will be hauled to the mine as soon as the roads are in good enough condition. The Alaska continues to produce liberal quantities of the wonderfully rich ore for which it has recently become famous.

BULLION.—*Transcript*, Jan. 5: The shipments of bullion from neighboring mines through Wells, Fargo & Co.'s express office at this point during the month of December, amounted to $1,116,500. That is not a very bad showing, considering that there is nothing being done by the hydraulic miners.

Sierra.

BALD MT. EXTENSION.—*Mountain Messenger*, Jan. 3: Bald Mountain extension incline, Forest City, is up over 150 ft, leaving but 90 ft incompleted. Everywhere the gravel is rich with gold, and the prospect is that the new year will develop another Bald Mountain, whose gross yield has already exceeded $4,000,000. H. Thomas and J. Adams, at St. Jo Bar, near Goodyear, have their tunnel 700 ft in a bench above the river, and are sluicing gravel that pays very well. Dan Loring has sold his gravel claim in Hog Canyon for $1,000. He also received a handsome Christmas present, and thus has been fortunate all around. Dan must have been born under a lucky star.

IN FULL BLAST.—Sierra *Tribune*, Dec. 26: Supt. Lowry has put a full crew of men at work in the Bald Mountain Extension mine, at Forest City, since the storm set in, and the washing of gravel has already begun. It is only a question of a short time when the stockholders in that mine will receive dividends regularly every month.

A PAYING DRIFT MINE.—Sierra *Tribune*, Jan. 3: The Empire gravel mine, at Howland Flat, has for some time past been yielding about 50 ounces of gold per week. There are 45 men employed there at present.

A $3,000 QUARTZ BOULDER.—In the Ironbound placer mine, owned by Jim Denoon, and located near Gibsonville, a quartz boulder was discovered by mere accident recently, that is estimated to contain $3,000 of gold. The boulder weighed between 200 and 300 pounds, and a streak of gold running through it the thickness of a $20 piece.

MINING SUIT.—Sierra *Tribune*, Jan. 2: The Marguerite Mining Company have brought suit against Charles Qurrillo to restrain him from so operating his placer mine at Loganville that the debris therefrom will flow into their ditch and flume. The plaintiff prays for $10,000 damages, and also ask for a perpetual injunction enjoining him from continuing work in such a manner as to injure their property.

San Diego.

A NEW MINING DISTRICT.—Arizona *Sentinel*, Jan. 2: At a meeting of miners held at Gold Rock Camp, near Ogilby, on December 15, 1884, a new mining district was organized and given the name of the Ogilby mining district, with boundaries as follows: Commencing at Ogilby section house on the line of the S. P. R. R., near Yuma, thence running in a northeasterly direction a distance of ten miles; thence in a northwesterly direction, twelve miles, thence in a southwesterly direction to Cactus station, thence along the line of the Southern Pacific Railroad to Ogilby station, the place of beginning. The ores of the district are free-milling gold, and are found in large bodies of high grade. Two shipments of ore have already been sent to San Francisco and milled, and gave good returns. Another shipment of several tons, which is the third inside of three months, is now in San Francisco. The mines are situated four and a half miles from Ogilby station, on the line of the S. P. R. R., and are in San Diego county, California. They were discovered by P. Walters, of Santa Monica, last January. Previous to this above discovery the same class of ore was only found in Durango, Mexico. Some idea can be formed of the magnitude of the ore bodies from one claim called the Black Butte, which shows a body of ore forty ft in thickness and six hundred ft in length. An open cut has been driven twenty ft into the ledge, which is all in pay ore. Assays made from this cut have milled $100 per ton in San Francisco. There are three other bodies of ore of the same dimensions and value. One other claim has been opened by two cuts and shows 64 inches of ore that will mill $200 per ton. The true location of the discovery has been kept secret until lately, when a regular mining district was formed and its laws established. The officers of the district are: P. Walters, president; Edwin Laundy, recorder, and P. J. Kennedy, secretary. A load of ore was sent to San Francisco a week ago last Saturday for reduction, and another last Monday. The owners complain that they have to pay $40 per ton freight to San Francisco, which is three times as much as the Calico miners pay on high-grade ore to Denver, Colorado. As a consequence, they will erect a mill on the Colorado and cease shipping ore to San Francisco.

San Bernardino.

CALICO.—*Print*, Jan. 3: Work is progressing on the Sun, the principal mine in West Calico. J. P. Madson and Jos. Laswell have bought the Peck Bros. lease on the Bullseye mine. They have also leased the Silver Moon, adjoining the Snow Bird, and have extracted several tons of good ore, which have been taken to the Daggett Sampling Works.

NEW YORK DISTRICT.—New York district, situated some twenty-five miles north of the Mojave Division of the Atlantic and Pacific railroad, embraces within its limits of ten miles square, the heaviest timbered and best watered section of the long mountain range of that name. Messrs. John McBride and Wm. Miller are the principal owners in the large group of mines in New York district. For about ten years they have been doing the assessment work on about a dozen mines, besides prospecting carefully, and as a result their dumps are covered with a large quantity of ore, the greater part of which is low grade, averaging from $40 to $60 to the ton. The mines in this district have large, bold ledges, which indicate permanency, and judging from the ore uncovered by the numerous prospect holes, there is sufficient to keep a ten-stamp mill in operation indefinitely, and which would result in a steady income of a high percentage on the investment. Messrs. McBride and Miller, assisted by J. S. Rainy, are now working on these mines and feel confident that they will be able to put them in such a condition as to attract capital, and offer inducements that will guarantee the erection of reduction works and the prosecution of developments on an extensive scale.

Trinity.

NEW RIVER.—Trinity *Journal*, Jan. 3: Mr. Brooks informs us that Messrs. Love and Hall have discovered a very rich lode on the ridge about half a mile above the Mary Blane which is unquestionably an extension of this famous mine, as the rock is exactly of the same character and prospects equally well. The new find is on top of the divide and exactly in line with the celebrated Klamath and Black Bear mines. He also learned that a very rich silver mine had been discovered on what is known as the Happy Camp Mountain, lying between the New River mines and Willow creek. It is reported to be six feet in width and very rich. There are at present from 60 to 100 men in at the New River mines, principally engaged in getting out timber and erecting buildings. Provisions are scarce and it is doubtful if there is enough on hand to last until spring. Prospectors are advised not to rush in too early.

NEW RIVER.—Humboldt *Standard*, Jan. 3: We learn from Oliver Clements, one of the owners in the Hard Tack mine, that they have plenty of ore out and expect to keep their arastra running all winter. They will work a ton and a half of rock per day. The arastra is run by water power. There will be two stores opened in the spring at the point known as New River City—one by Mr. Campbell, of Trinity, and the other by Frank Loring, of Calihan's Ranch, Scott's Valley. White Rock now has the start. Alex. Cœur & Co. have a large store at the last place, where is kept an abundant supply of provisions, mining tools and everything needed in a mining camp. Pete Larsen, late of Arcata, has a store at this point, which he runs in connection with his hotel and saloon. The Mary Blaine saw-mill is getting out a good supply of lumber for mining purposes. The 5-stamp quartz mill is all ready to start up work on the ore from the Mary Blaine mine. Gus Gutsen has struck the ledge where it is two ft wide in his claim. Mr. Clements thinks this one of the most promising mines in the district. The rock shows free gold. The gold is very fine and seems to be distributed all through the quartz. The Yankee Boy mine, owned by Boles & Co., is turning out fine ore. More work has been done on this mine than any in the district. A tunnel has been run 200 ft and connection made therewith by a shaft 100 ft, thus giving excellent ventilation. The company have a five-stamp mill all ready for operation as soon as Mr. Boles arrives with the fine screens. We will soon have good news from the Yankee Boy. Mr. Cœur, who arrived in Eureka yesterday, says he met 15 persons bound for the New River mines as he came out. There has been no snow since the storm the last of September. There has as yet been no need of fire except for cooking. Mr. Cœur, who runs a large store at White Rock, deemed it necessary, on account of the daily increase of population, to procure an additional supply of provisions. He will return next week with a train of goods. One of his trains has just gone in with five tons of flour. When he gets back he will have a sufficient supply to run the camp until the middle of May. He reports all in the camp working and well satisfied with the prospect. C. C. Dennis and L. Miller have taken a contract to put up an arastra for Tom Baker and Wm. Levasseur, to work the ore from the Tough Nut mine. The arastra will be completed in 30 days. Seventy-five tons of ore are now on the dump at this mine. Mr. Cœur reports meeting Mr. Loveland at Blue Lake, bound in. The latter will put a force of men at work on the Helen Mar mine, and keep them employed as long as the weather will permit. Everything looks favorable in the new camp.

Tuolumne.

A LUMP.—Tuolumne *Independent*, Jan. 3: Some time ago Mr. Thomas Whitto found a seven-pound lump of pure gold in his quartz mine near Jacksonville. Several coarse pieces of gold were found near it. This large piece was crusted with white sand, which prospected well. Inside of this was a white sand cement, which had to be cut off with a chisel. The lump being so heavy induced Mr. Whitto to persist in getting at the interior of the ball. At last the chisel exposed the gold, which proved to be pure, without a particle of quartz mixed with it, and weighed within a fraction of seven pounds. The Keeffe mine, at Santa Maria, still looks well. The vein has increased to ten inches in width, and is spangled with free gold. The Tioga mines have closed down for the winter. A few men will remain there. In the spring the mines are expected to blossom into prominence. The Tioga road via Big Oak Flat will be opened early in the spring. Messrs. M. Shine and D. Oliver struck another pocket of several hundred dollars at Brown's Flat, Monday. The Santa Maria mine closed down for the winter a few weeks ago. Too much snow to work to advantage is the reason.

A PROMISING MINE.—*Union Democrat*, Jan. 2: S. H. Teeters brought some very fine gold quartz to this office Thursday. It shows a considerable quantity of free gold, and contains besides a heavy percentage of high-grade sulphurets. It comes from the Hogle & Daegner mine at Sugar Pine, of which Mr. Teeters is now the sole owner. The mine was operated many years ago, but was abandoned on account of business reverses of the former owners. Last spring Mr. Teeters cleaned out the old workings and opened up the ledge. He was fortunate enough to strike a ten-inch vein of quartz, of which the above described is, he says, a fair average sample. The ledge between the walls is about five ft in width, but much of it is horse matter. However, ten inches of the kind of stuff shown us is a pretty good bonanza in itself. There is a tunnel 200 ft in length on the vein, which makes the mine very convenient. There is plenty of cheaply utilized water-power close at hand, and any quantity of fuel all around to be had for the cutting. The ten-stamp mill of Messrs. Long and Hampton at Jacksonville is kept steadily pounding away on ore from the Williatta mine. Mr. Hampton says the returns are up to their most sanguine expectations. As soon as spring opens he says they will enlarge the mill and increase the crushing capacity. Sinking in the Dead Horse mine has been temporarily suspended on account of the flow of water which cannot at present be handled. A new boiler is being put in place, and as soon as it is up the pump will be set to work and sinking resumed.

NEVADA.

Washoe District.

OPHIR.—Virginia *Enterprise*, Jan. 3: The west drift on the 500 level has reached the east side of the old workings and three drill-holes in its face are drawing off the water. The flow amounts to 23 inches. It is thought that the old workings are now about drained, but there is no way of getting into the 500 level above to measure the water. On the 1500 level a winze is being sunk at the end of the west cross-cut from the main south drift to connect with the northwest drift on the 1750 level of the Con. California and Virginia, and from the 1750 level an upraise is being made to meet this winze. The connection will give a good circulation of air on both levels.

HALE AND NORCROSS.—Work was discontinued on the 2800 level at the time of the accident to the Cornish pump at the Combination shaft, and has not yet resumed. A second cross-cut, 60 feet north of No. 1, had just been started on the 2800 level, and was out about eight feet when the Cornish pump was disabled. Work cannot be resumed until the pumps are again running in proper shape, as the compressed air is all needed at the shaft besides the running of bailing tanks filled the lower levels with steam, and renders them very hot.

COMBINATION SHAFT.—The broken pump bob at the 1000 level was repaired yesterday. Pending the manufacture of a new hose piece for the bob, the pump has been kept running at about half speed and the bailing tanks were also kept going, thus handling the water without difficulty. The new hydraulic pump is about ready to start up. The two discharge columns are connected at the 2600 level, and it only remains to connect the supply columns.

YELLOW JACKET.—A considerable amount of low-grade ore is being extracted from the old upper levels, and the mills on the Carson are kept in operation. A good deal of work is being done in the way of prospecting for new deposits.

CON. CALIFORNIA AND VIRGINIA.—An upraise is being made from the northwest drift on the 1750 level to connect with the winze now being sunk from the 1500 level of the Ophir. This connection will give a good circulation of air on both levels.

SIERRA NEVADA.—A north drift is being run on the 2500 level from a point about 100 feet west of the winze that goes down from the 2500 to the 2900 level. The drift is following vein material of a favorable character.

GOULD AND CURRY.—The main west cross-cut on the 825 level near the Savage north line is in a mixture of quartz, clay and porphyry of a favorable appearance. Frequent stringers of mineral-bearing quartz are found.

BEST AND BELCHER.—The west cross-cut on the 825 level at the Gould and Curry north line is still in vein material of a very promising appearance. Streaks of quartz are occasionally met with that give low assays.

ALPHA.—The work of prospecting a large body of quartz developed on the 600 and 900 levels is still continued, and frequent bunches and stringers of pretty fair ore are found.

UNION CON.—An east cross-cut was started on the 2700 level, night before last, at a point some 200 feet south of the main winze. The pumps hold the water at the 2700 level very easily.

CROWN POINT.—A considerable amount of ore that will pay a small profit for working continues to be obtained in the old upper levels. This ore keeps the mills on the Carson river in operation.

SAVAGE.—The E-street tunnel now has less than 50 feet to go to reach the point where it is expected that low-grade ore will be found. The tunnel is already in a vein formation.

BELCHER.—The old upper levels continue to yield a considerable amount of low-grade ore, which is being sent to the mill on the Carson river for reduction.

OVERMAN.—The extraction of ore through the old Petaluma-street tunnel has been discontinued, as it was found to be of a grade too low to pay for milling.

ALTA.—The east cross-cut on the 1350 level is still in quartzite of a promising appearance. The water continues to rise, but very slowly.

SCORPION.—The main north drift on the 500 level is still being advanced through vein porphyry and other vein material.

MEXICAN.—The main south drift on the 2700 level has been cleaned out and repaired.

Columbus District.

MOUNT DIABLO.—*True Fissure*, Jan. 3: The workings on the sixth level show no change. The upraise from the fifth level has connected with winze No. 2, and a stope has been started on a small streak of ore at the foot of the raise. The ledge near winze No. 1, on the fifth level, looks promising, and is giving considerable $35 ore. The west drift on the fifth level has advanced 10 feet, and has shown a foot of $75 ore for this distance. The stope started near the face of the drift shows 18 inches of $75 ore. A small amount of ore is being taken from between the fourth and fifth levels near winze No. 1, and also from between the third and fourth levels near the same winze. The stope between the second and third levels, east of the shaft, shows a narrow ledge of $175 ore. The stope between the same levels, west of the shaft, is giving considerable $50 ore from a promising ledge. A small amount of ore is being taken from the second level, and also from the intermediates between the first and second levels.

Eureka District.

THE RICHMOND.—Eureka *Sentinel*, Dec. 31: One would hardly imagine that times were dull after going up to the Richmond works and looking around for a while. Everybody there is busy, and each man is at his particular occupation. Perfect order and system is noticeable, and nothing is left undone to make every dollar count to the advantage of the company. The new Speiss furnace is running splendidly, the molten matter pouring out from the spout in a thin liquid stream, the volume of which is equal to that of a big stream of water pouring from a street hydrant. The big pots are removed from under the spout by means of a crane and ranged around the latter. The lead, which, if left long enough to cool, would stick to the pot, is tapped from the bottom, and as soon as this operation is performed, a horse is hitched to the pot and it is drawn away and the iron dumped out of it in an incredibly short time. The heavy snowfalls prevent custom ores from coming in in the usual quantities, yet there is plenty to keep the furnaces running. It is said that in the Richmond mine they have large quantities of ore reserved for the winter's run, and the general indications are that the company is still quite prosperous.

Grantsville District.

QUIET.—Belmont *Courier*, Jan. 3: Grantville

continues to grow quieter. Better times are in store for it, however, and the chances are a good deal more than even that the old camp will soon be heard from again as a bullion producer.

Hot Creek District.

ORE.—Belmont *Courier*, Jan. 3: Judge Turin, of Tybo, has taken several tons of ore from the New Dominion mine, of Hot Creek district, to Eureka to be worked.

Jefferson District.

ORE SHIPMENT.—Belmont *Courier*, Dec. 27: E. F. Corrillo was in from Jefferson this week. A few days ago he made a shipment of ore from Jefferson to Eureka, where they work ores for $10 a ton. He has one of the finest locations in Jefferson district which he is working steadily. We ought to offer inducements to chloriders in this county so that they could work their ores at home. It would be profitable to the chlorider and mill owner alike it such things were.

Manhattan District.

ORE. — Belmont *Courier*, Dec. 27: We were shown on Christmas, by County Treasurer Adam McLean, some very fine specimens of ore from locations in Manhattan mining district. From what we can learn a judicious outlay of capital would soon make these locations paying mines. London coin is doing the work on them, and we understand that when sufficient of it is done they will be patented. Lack of capital has kept back mining in this county, and it is about time that mine owners "tumbled" to that fact. It is the hardest thing in the world to open a silver mine without money. It is not every day that you can find a silver mine able to stand the bullion discount and the high charges for shipping and reduction. Capital must handle most silver mines before they become profitable investments, and before said capital will do so it must have legislation favorable to silver. These mines in Manhattan district would have remained quiet to-day, but for this London capital to develop them. In this county there are numerous properties that would return handsome profits if capital would take hold and handle them properly. It does seem queer that $15 or $20 ore will pay in Colorado, Idaho and Montana—an $40 ore will not pay in Nevada.

Secret Canyon District.

THE LITTLE MINNA MINE.—Eureka *Sentinel*, Dec. 29: Charley Norton, who, for some time past, has been engaged in sinking a shaft in the Little Minna mine, Secret Canyon, was in town yesterday. He says the shaft is down a depth of 23 ft, and the entire bottom of it is in ore, an 18-inch streak of which assays $120 to the ton, and the balance of the body from $60 to $90. Mr. Norton, who is a miner of considerable experience and knowledge, says the ore very greatly resembles that extracted from the Horn Silver mine of Frisco, Utah. In a few days he will return to Secret Canyon, when he will proceed to erect a building over the shaft and a boarding-house near by for the accommodation of several miners, who will be put to work on the new discovery at an early day. The Little Minna is the property of H. K. Mitchell, Esq., who has the congratulations and best wishes of his many friends.

Taylor District.

TRIBUTE.—White Pine *Reflex*, Dec. 29: John Devlin and S. R. McLaughlin who are doing tribute work on the Monitor mine opposite Hilp's store, have struck quite a large and rich body of ore. Another ore team was put on this morning to haul ore to the Monitor mill, which has been shut down for a few days, for the purpose of making some needed repairs. Twelve men were laid off at the Monitor mine Monday last, but nearly all have been put on again. Bad roads and no dump room for ore was the cause of the knocking off. All the miners in the employ of the Argus Mining Company were knocked off Wednesday. The roads are so bad that the ore cannot be taken away and the dumps are full.

Tuscarora District.

THE BANNER CONSOLIDATED.—*Times-Review*, Jan. 3: The *Times-Review* is requested to state that the Star Spangled Banner and other mining claims have been consolidated and will hereafter be known upon the official records of this district under the above title. The consolidation is made in accordance with the Act of Congress approved February 11, 1875, amending section 2324 of the U. S. Mining Laws.

INDEPENDENCE.—*Times-Review*, Jan. 3: The usual progress has been made at all points, showing no change since last report.

BELLE ISLE.—No. 1 upraise on east vein has been carried up during the last week, two feet; total hight 54 feet, showing no change.

NORTH BELLE ISLE.—The usual progress has been made. The face still continues to look favorable.

NAVAJO.—The east cross-cut, 350-foot level, has been advanced, during the past week, 14 feet. Total distance 70 feet, showing no change. All other work in and about the mine progressing as usual. The stopes are producing the usual amount and grade of ore. The mill will start to-day about noon time.

GRAND PRIZE.—*Times-Review*, Jan. 2: South drift on the 400-ft level has been extended 21 ft during the week. The drift on the 300 is in 28 ft. Progress in the 200-ft level for the week, 18 ft. Repairs are progressing at the mill as rapidly as circumstances will permit. As soon as they are completed, will run through what ore is in the mill.

ARIZONA.

NOTES.—Prescott *Courier*, Dec. 29: Jack McDonald and his men are taking rich ore out of the Blue Dick mine. Men at work in the Buzzard are extracting good ore. A miner who recently came in from Hassayampa and Dosoris district is quite elated with Dave Grubb's mine, which is, he thinks, the mother vein of this portion of Arizona. It has been traced seven miles and carries metal all the way. The ore is very rich, but in general is low-grade. Being in the midst of a fine timber belt, with plenty of water in and near it, the time cannot be far distant when the right kind of people will come here and work this and similiar veins as they ought to be worked. The latest arrival from the Agua Fria district, Michael Hickey, assures us that the shafts are going down in good ore; veins widening and prospects of all kinds encouraging. Of the Pine Spring mine, Turkey creek district, a letter from a friend, in whose statements we have confidence, reads as follows: We have been working on the mine when the weather would permit, started on Thanksgiving day on the new shaft. 300 feet north of the old shaft, going down 50 feet and cross-cutting from the shaft to the vein 10 feet, drifting vein 25 feet in poor ore. On the 17th inst. we broke in on very rich ore, having the appearance of being high-grade, the character of which is oxide and black sulphate of silver. At present we cannot tell how extensive it is, but will let you know if it continues to hold out.

QUIJOTOA.—Cor. *Associated Press*, dispatch of the 6th says: Quijotoa has again gone wild over a recent discovery of what appears to be a new bonanza, rivalling in extent and richness, even the famed Peerless and Crocker. The location of the discovery is upon the western slope of Mount Ben Nevis, upon a claim called the Devon, owned by W. F. Kitt of Tucson, located in December, 1883. The ledge is from 50 to 100 feet wide and from 100 to 150 feet high, and can be seen for a distance of 30 miles. The ledge is coated with white bastard quartz, and, but for its proximity to Bononza group, would have been pronounced valueless by the expert who examined it. A few blasts of powder, when doing assessment work a few days since, demonstrated the entire mass to be a high grade ore, rich in horn and malleable silver. A few months since its owner offered it for $2,000, but could not find no purchaser. Now its value can hardly be computed. It is all the talk here, and the excitement at Quijotoa concerning it is intense.

CLOSED DOWN.—*Silver Belt*, Jan. 3: The heavy and continuous fall of rain, for four days ending last Monday evening, following so closely the recent snow-storm, has completely saturated the ground and rendered the roads deep and heavy. It has practically put a stop to teaming for the present and it will be some little time yet before any considerable amount of coke for the Old Dominion Company, or supplies for our merchants, can be brought in. The supply of coke at the smelter was exhausted Monday evening, making it necessary to close down. Operations at the mine had been discontinued the day previous. It is an unfortunate state of affairs, but a large amount of coke is en route from Willcox and an early resumption at the mine and smelter is probable.

THE MINES AND SMELTER of the San Carlos Copper Company, which were shut down during the recent heavy rain, have resumed and will, it is expected, continue to run. They have about a month's supply of coke on hand. The company have taken a six months' working bond on six claims owned by Jacob Schneider, situated about five miles from their works. The consideration is $1,000. Work has been begun on several of the claims and ore is being packed on burros to the smelter.

THE LYNX CREEK PLACERS.—Arizona *Miner*, Dec. 30: Since Geo. B. Inman secured a lease for the season of the Lynx Creek placers from Governor Tritle and Frank Murphy, the work of hydraulic mining there has been actively pressed for the last two weeks under the direction and management of Harry Carpenter. Fourteen men are kept constantly at work, and their efforts, together with the assistance of over 200 inches of water, will realize a handsome pile of dust for the lucky lessee during the winter. The first clean-up will be made on New Years day, and present indications point to its being an unusually rich one.

COLORADO.

NOTES.—Georgetown *Courier*, Jan. 1: The McLinn tunnel, on Sherman Mt., has cut the St Julian lode. A mill run from the Owasco mine on Brown mountain, last week, returned in three classes, 631, 339 and 210 ounces silver per ton. The double hoister on the Snow Drift lode, which was put in by the Union Manufacturing Co. of this place, started up last Monday. Buel, Sites and Smith, owners of the Hamilton lode, North Empire, have sunk a shaft 60 feet and started a drift east, in the breast of which are exposed two quartz streaks of 18 and 15 inches respectively. The Old Settler mine in Banner district is being steadily worked with encouraging results. A good plant of machinery will soon be erected over the main shaft, as the new-fangled whim is incapable of doing the hoisting. Three excellent mill-runs have recently been made on ore from the Vulcan mine. The first, from Nick Ennis' lease, returned in two classes, 427 and 211 ounces silver respectively. The second from the Johnson lease, in one class, returned 336 ounces. The last, from Myers Bros.' lease, returned in two classes, 686 and 267 ounces silver, and 37 per cent lead. Mr. O. E. Clark owner of the Independence mine in Argentine district, says that during six months of the year he can send his ore to Keystone, a distance of eight miles, and ship it to Denver by way of Leadville, Salida, Canon City and Pueblo, for one dollar less per ton than he can ship by way of Georgetown to Denver. The distance in the former case is over 300 miles, in the latter, 60 miles.

PLUMAS ITEMS.—Mining is brisk at this end of the county just at present, and the mines are averaging fully as high as usual. The reported sale of Mr. Hamill's interest in the Terrible mine, to the company has created no little comment, and the general opinion seems to be that the change will be beneficial to all; it is to be hoped that it will, as this valuable property has for some time been doing but poorly, and it is thought that the company will expend considerable money in putting it in shape again. A few of the lucky lessees on the Baltimore made Supt. Fillius a Christmas present of a handsome gold watch, worth $240. The Stevens mine is showing up splendidly and many of the lessees are preparing to remain all winter.

DUMONT.—A contract to sink the shaft on the Monitor lode an additional 50 feet, has been let. Recent tests from this vein gave five ounces in gold to the cord. In the west drift on the second level on the Albro, the boys have just exposed a vein of solid ore about eight inches in thickness, of a very good grade. Work is now progressing on the Night Hawk lode. From present indications, Dumont will be quite a lively camp this year, as quite a number of old properities are to be developed.

IDAHO.

THE RED ELEPHANT.—Wood River *Times*, Dec. 31: Mr. Richardson who resumed work on the Red Elephant group of mines, at Bullion, when Dr. Miller's bond expired, about three weeks ago, is beginning to think that he will have as good a mine as there is at Bullion. A few days after regaining possession, Mr. Richardson cut into an ore-vein 8 to 14 inches wide, which has already yielded 10 to 15 tons of ore while being opened. A shipment of 12 tons was ready when the storm began, which will be brought to Hailey as soon as the roads shall permit it. The ore is evidently of good grade, and carries all of 125 ounces silver per ton.

LESSEES STRIKE ORE.—Kunkle, Buckland and Nicol, who leased the west end of the Narrow Gauge No. 2 mine, and began work on the 20th of November, have struck a good sized kidney of ore from which they have already extracted between 10 and 12 tons, with as much more in sight. The ore is fine galena and carbonates, and will, it is believed, average 150 ounces per ton. They resumed work where Supt. Clarke quit, two years ago, and struck ore within four feet. They are running a tunnel to tap the vein at greater depth, and expect to find a still greater width of ore than in the old workings, where it is in 12 to 15 inches.

RICH ORE.—Idaho *World*, Jan. 2: Rich ore was recently struck in the Forest King mine—better than any the mine has heretofore turned out. Four men take out ore as fast as the 5-stamp mill can get away with it. A while back it was the intention of the owners of the mine to shut down the mill about New Years day, for the reason that their supply of wood was limited; but the mill is still pounding away, and will run two or three weeks longer, and may continue running all winter. It is no easy matter to get in a supply of wood now, on account of the deep snow, but nevertheless the boys, who have lots of pluck, think of making an endeavor to get wood enough to keep the mill going right along all winter. During the past fall they were kept busy putting up their mill and developing the mine, and consequently did not have time to lay in a supply of wood.

MONTANA.

BANNACK CITY ITEMS.—*Inter-Mountain*, Dec. 29: One of our friends at Bannack City furnishes the following interesting batch of items from that section: Snow is 18 inches on the level. Bachelder Bros. are working three men. Snow between Bannack and Elkhorn is 22 inches on the level. Assessment work is being done on a number of good properties. Hayes & Co. are working 10 men on the Blue Wing property and in good ore. W. M. Lewis & Co. are sinking on their placer claim with encouraging prospects. The New Departure is a bonanza with a large amount of ore on the dump. Bean & Co. are working 15 men on the Bonaparte lode. They have a 24-inch streak averaging over 60 ounces of silver to the ton. Sears & Co. are working four men on the Delmonte lode. They have two inches of ruby ore that will mill up in the hundreds.

NEW MEXICO.

FROM ALL POINTS.—Silver City *Enterprise*, Dec. 26: Many new and rich strikes are constantly being made at Gold hill. Forty-four men are now employed on the Young Man mine, at Gold gulch. Black and Park the discoverers of Gold hill, are digging a well and preparing to ship ore. A less amount of assessment work is being done at Shakespeare this season than for many years past. Lewis and Cottrell, of Gold hill camp, have 30 odd sacks of rich horn silver and chloride ore ready for shipment. It will run into the hundreds. The new company at Gold gulch are working 30 odd men. They pay off on the fifth of next month, after which the force will be largely increased. It is reported that W. H. Newcomb has arranged to work a number of mines on Legal Tender hill, west of town and treat the ore in the new concentrator. C. C. Fletcher, of Chicago, is erecting a reverheratory furnace of 10 ton capacity at the camp of Tres Hermanas. Mr. Fletcher has purchased considerable property there which he is developing. Mr. L. A. Snyder recently made a very rich silver strike in the neighborhood of Gold hill. The vein is about 10 inches wide and the ore is so completely impregnated with horn silver that assays are unnecessary. Lewis and Cottrell, of Gold hill, have a 23 inch vein of lead which averages about 70 per cent and from $10 to $12 in silver. The most of the vein is almost solid metal. The lead crops out for over 1,000 ft, and varies from two to three feet in width. The company's mill at Pinos Altos has been closed down for some days past on account of the muddy roads, it being impossible to haul ore to the mill. The mill has been running on a 500 ton contract for Dr. Bailey, of this city. The contract would have been finished by the first had it not been for the bad weather. Allen, Richards and Swancoat have commenced work upon the New England claim at Fleming. A rich strike in free gold has been made in the Mogollons by Mr. Kelly. It is said to be one of the biggest and richest strikes ever made in that country. It is reported that a new strike of considerable magnitude has been made in the Peacock is undoubtedly one of the best properties in the country. M. Saulisbury, of the Benson smelter, has offered $100,000 for the Last Chance mine, at Pyramid. Mr. Saulisbury, has treated several thousand tons of ore from this property and doubtless knows more about it than many of the owners. The latter are holding off for $150,000 but it is probable that they will come to terms offered rather than let the property lie idle longer. Ten tons of high grade ore arrived here on Tuesday from John A. Miller's mine, in the Mogollons. The Coeney and Peacock mines are outputting about 100 tons of ore a month and find it difficult to have it hauled away as fast as desirable. Teams are in demand, both here and at Kingston. A test shipment of one carload of ore was recently made from the Last Chance and Superior mines, to the Grant works at Denver. The result was very satisfactory to those interested. The ore concentrated five tons into one, with a loss of only five per cent. Mr. Grant agreed with the owners of the property to put up works similar to those in which the ore was treated, at Shakespeare, with a capacity of 30 tons daily, for $10,000, run them for three months and guarantee them to successfully treat the ores of the camp. The proposition has not yet been accepted but it probably will be. From Mr. G. G. Posey, who just returned from Lake Valley, it is learned that 609 tons of ore were shipped from the company's mines in seventeen and a half hours one day last week. Eight hundred tons would have been shipped inside of 24 hours but for the supply of freight cars ran out. The ore was hauled from the dumps, loaded on the cars and shipped in the time specified. Specimens of gold nuggets were shown in this city last week by John Barton, which were taken from the Mitchell mine in the Steeple Rock district. The mine is owned by McDonald & Barton and has been worked for several years. The gold occurs in sandstone, which is pounded up and carried down to the creek where it is washed out, yielding from $20 to $40 per day to the man. The property has recently been bonded to California parties for $40,000. There are many other claims in Steeple Rock district which carry free gold.

ORE SHIPMENTS.—Silver City *Enterprise*, Jan. 2: On Monday last the Solid Silver mining company shipped thirteen tons of ore that averaged $800 per ton, from this place. The total value of this carload of ore is estimated at $104,000. The drifts in the lower working of this mine are piled with ore of fair grade which will hereafter be treated at the concentrator in this city or shipped to one of the upper country reduction institutions which receives most of the ore from this section. Everything indicates that Gold Hill is destined to become one of the greatest gold producing districts in New Mexico. For the amount of work done by the claim owners, the camp shows abundance of mineral. Several shipments have been made of ore that runs very high and others will be made as soon as the inclement weather shall have passed away.

OREGON.

THE TRASK RIVER MINES.—*Oregonian*, Dec. 29: Regarding the Trask River mines, of which so much has been said of late, Mr. J. L. Storey of McMinnville gives the following information: The entire country bordering on the Trask appears to be filled with silver. The portion most thoroughly prospected is near the old "Bear Wallow." The specimens sent to Portland from that point were reported to have assayed $1300 to $1400 to the ton. But Mr. Storey says it is his opinion that that was largely exaggerated, as an experienced assayer in Tillamook experimented with rock from the same ledge and could make but $40 to the ton. At the point from which these specimens were taken, those working the mines are erecting homes and preparing to engage in the mining business in dead earnest. Already quite a number of shanties have gone up and more will soon be erected. But the main ledge commences on the upper side of the peninsula, about a hundred yards below where the road crosses, and running diagonally in a southwesterly direction passes through the peninsula, and crossing the river the lead enters the mountains on the west side of the stream. At this point will be placed the rock crusher and quartz mill and other apparatus necessary for successfully working quartz rock. There are already about 50 men in there for the purpose of mining, and if the mines turn out as rich as they now give promise of doing, there will perhaps be from two to five thousand men on the Trask during the next season. A company composed of eight men have been there for some time; have located claims of several thousand ft, and it is this company that will put in the mills. It is to be hoped these mines will prove as rich as reported, as it would not only be a big thing for Tillamook county, but would help out all the adjoining counties to no small extent. W. H. Sitton, of North Yamhill, says the people of this section are considerably excited over the mines that have lately been found on the Trask, and that many will go over to locate claims. Should those mines prove rich, it will be a "feather in North Yamhill's cap," as that would be made the supply depot for the mines and bring a large trade to the place.

GRAVEL.—Jacksonville *Times*, Jan. 2: Henry Hutchens is in charge of the mines of the English and Blue Gravel companies. Walter Simmons, of Galice creek, has his mines in good shape, and expects to make a good return this season. Since the frosty weather began, the water has been turned out of the Sterling Co.'s ditch as a precautionary measure. The weather of the past few days has not been very favorable for the miners, though we think a change may be looked for soon. Many of the miners were at work when the cold snap began, but most of them are again at their leisure, we are sorry to say. The frosty weather is inclined to dissipate the hopes of many of the miners who have been so badly disappointed in the past few years. Judge Crockett, of Josephine county, informs us that a party of Colorado miners are prospecting a quartz ledge near Tunnel 9, and are well pleased with the developments so far. Geo. Schimpf has received word from the parties who intend testing his quartz ledge in Willow Springs precinct, to the effect that they will be on the ground immediately after the holidays. From Anton Rose, who recently returned from Galice creek, we learn that the miners there had an abundance of water when he left—more than usual at that time of the year. They are all doing well, several nuggets of good size having been picked up in some of the claims.

UTAH.

REVIEW.—Salt Lake *Tribune*, Jan. 3: The receipts of bullion and ore in this city, for the week ending December 31st, inclusive, were $180,967.84, of which $156,091.84 was bullion, and $24,876 ore. For the week previous the receipts were $130,299.07 of bullion, and $15,816 of ore. The shipments of Horn silver for the same week were twenty-eight cars of bullion, $70,000; making the total shipments for 1884, as per current weekly memorandums, $2,829,000. The true output was 22,380,027 lbs. unrefined lead, and 1,435,696 ounces of silver, which, at $70 per ton for lead and $1.08 per ounce for silver, would give a total value of the output of this mine of $2,333 851.68. This shows that the daily estimates of value per car, as shipped, were about 17 per cent. too high; but that was a much better current estimate than that of the year before. Out of the gross output were paid four quarterly dividends of $300,000 each. It was decidedly a good year's work. The Ontario shipped for the week fifty-three bars of bullion, valued at $36,921.65, making the total for the year, as per current reports, $1,695,716.93. The true output was 1,179,567 ounces. The Ontario paid regular monthly dividends throughout the year of fifty cents per share, or $75,000 per month—$900,000 in all. And it is good for many more. The Silver Reef district sent up the past week three bars of Christy silver, $5,080, and one car Stormont silver, $1,550; a total of $6,630. The product of the Hanauer smelter for the week was eight bars of bullion, $21,100.

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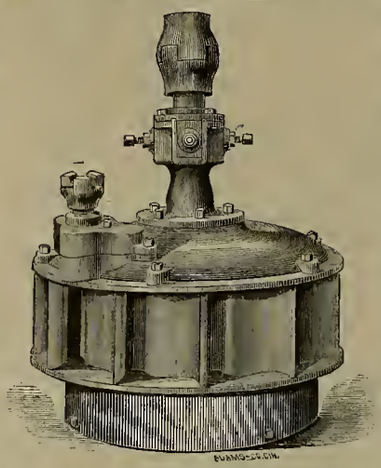

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SECOND.—The Wheel, Outer Case, Register Gate, and Top, each being one casting, and all the work on them being performed by machinery, and fitted to a standard gauge, secures the highest perfection in construction and operation, and the utmost strength.

THIRD.—The entire absence of rods, bolts, levers, light castings, or "traps" of any kind, securing the greatest durability, with entire immunity from derangement of parts and breakage, so common in all complicated wheels.

FOURTH.—The conical interior of the wheel, which secures perfect freedom of vent for both tiers of buckets, enabling the wheel to rid itself immediately of "dead water" without friction. This feature is entirely original with this wheel, and is found to be of very great practical importance.

FIFTH.—Its "Duplex Chute," formed by the Register Gate and outer case. The outer case moulds the current of water, delivering it in a solid body through that part of the Chute comprised in the Register Gate on to the wheel. This Chute being fixed, the direction of the current is never changed, nor its velocity checked, consequently nearly the same per cent. of power is obtained with the gates only partially drawn as when fully open.

SIXTH.—A Gate thoroughly protected from vertical pressure, which, when partially closed, does not break the column of water or change its proper direction, which is easily operated, and yet shuts so tight as to prevent leakage; and the shutting of which is not likely to become obstructed or prevented by foreign substances.

SEVENTH.—The housing up of the pinion and segment for operating the gate, which entirely prevents all danger of breakage by foreign substances getting between the teeth. No other concern does or can use this improvement, which effectually does away with a source of most frequent annoyance and delay.

EIGHTH.—The amount of power it yields, together with its Simplicity, Durability and Strength, fairly entitles our wheel to the name given it, The Eclipse Turbine. In further proof of the power of this wheel, we invite a careful inspection and comparison of our tables with corresponding tables for all other similar wheels.

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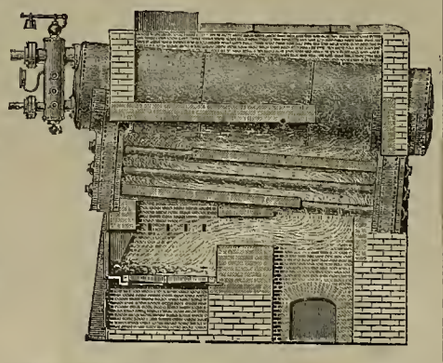
Economy in space and fuel. Safety at high pressures. Freedom from scaling. Equally adapted for power and heating purposes. Especially adapted for mills, factories, hotels, stores or any place where safety is a necessity. Will work well with muddy water and any kind of fuel.



TESTIMONIALS.

SAN FRANCISCO, Sept, 19, 1884.

Risdon Iron and Locomotive Works—Gentlemen: We have had one of your Heine Patent Safety Boilers in use for four months at our Borax Works, in Alameda. It does good work and gives perfect satisfaction. Yours truly,
(Signed) WM. T. COLEMAN & CO.

SAN FRANCISCO, Oct. 4, 1884.

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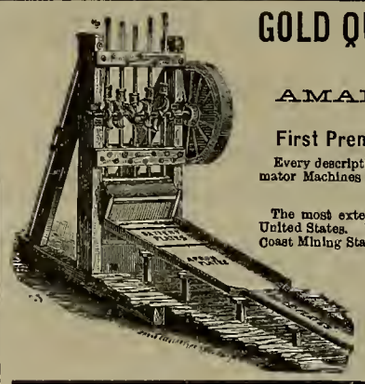
☞ IRON CASTINGS OF ALL DESCRIPTIONS.



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Silver Plated

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—o—

No. 1 (XX) is the Strongest Explosive Known.

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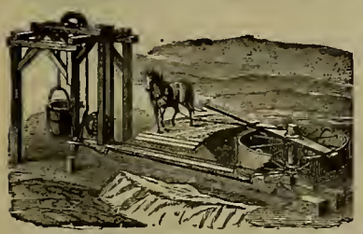
MINERS' HORSE WHIM.



ONE HORSE CAN EASILY HOIST OVER 1,000 LBS. at a depth of 500 feet. The Whim is mainly built of wrought iron. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending the bucket. The standard of the whim is bolted to bed-timbers, thus avoiding all framework. When required, these whims are made in sections to pack on mules.

120 In Actual Use.

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MANUFACTURER,
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INTEREST IN A QUARTZ MINE.

I am prepared to give any responsible parties a good interest in my Quartz Lead, who will sink a shaft one hundred or more feet deep, or run a tunnel on said lead of one hundred or two hundred feet in length. The lead joins the rich gold quartz mine of Senator John P. Jones, W. A. Nevills, and others. It is situated three miles south of Jackson, Amador county, Cal., and near Middle Bar on the Mokelumne River. I believe that the shaft or tunnel will develop gold-bearing material the same as has been found in adjoining mines. The Mammoth found rich rock at 100 feet from the grass roots. From one blast in that mine they took out $75,000 to $100,000. This is a good opportunity for any one to go into a legitimate mining enterprise of merit. Call upon or address

A. CHAMBERS,
Jackson, Amador Co., Cal.

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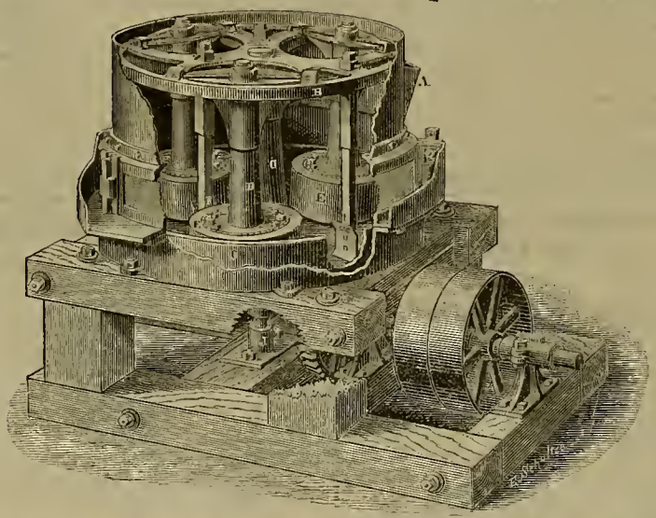
INVENTORS. MODEL MAKER,
258 Market st., N. E. cor. Front, up-stairs, S. F. Experimental machinery and all kind of models. Tin, copper and brass work.

F. A. HUNTINGTON'S
CENTRIFUGAL ROLLER QUARTZ MILL.



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The Huntington Mill has passed entirely through the experimental stage. Two years of continuous use at a number of mines in California has enabled the inventor to perfect and improve the machinery until he feels justified in assuring the public that he has reached THE ABSOLUTE in the construction of a perfect Quartz Mill.

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.....AND.....
Mining Machinery
Of Every Description. Send for Circulars.
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Engineers, Iron, Brass Founders,
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HOISTING and PUMPING ENGINES, PUMPS, AIR COMPRESSORS, ROCK DRILLS, MILL ENGINES, BATTERIES, PANS, SETTLERS, BOILERS, HEAVY GEARS, SHAFTS, ROUND and FLAT STEEL CABLES, MINE and INCLINE CARS, CAGES, and BALING TANKS.
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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price. Our New Illustrated Catalogue, with prices, will be sent on application.
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Giant Powder.

Its Power and Uses.

Alfred Nobel was the inventor of dynamite or giant powder. He had been using ordinary powder in blasting operations in Swedish quarries, and found the work slow in progressing. Acquainted with the nature of nitro-glycerine, he conceived the idea of soaking common gunpowder with it before blasting. The effect produced was very great, but this only led the way to the greater invention, dynami e—finely pulverized silex, or silicious ashes, or infusorial earth saturated with about three times its weight of nitro-glycerine, and constituting a mass resembling damp graham flour. The power of this compound can only be estimated theoretically, but its uses are manifold and do not need to be specified. Mr. Nobel's invention was not long in attracting attention. It soon came into use all over the civilized world, but, like every other good article, many imitations were put on the markets under various names. He secured patents for it, however, where possible. When it had attained considerable fame, Mr. Nobel was attracted to the United States as a new field of operation. Not being a citizen, he could not patent the article here, but through his friend, Mr. Julius Bandmann, this was finally done, however. Mr. Bandmann was senior partner in the commission house of Bandmann, Nielsen & Co., of this city, a firm dating back to 1849. The firm had been doing business on Montgomery street, but they believed that the future great houses of the growing city would center nearer the water, so they constructed the building at present occupied, 210 Front street, and took possession in 1852. Here they have remained ever since. In 1868 their line of business was changed, and they began the handling of Mr. Nobel's patents. Mr. Bandmann sold to the Giant Powder Company, a new incorporation, the right to use the powder on this coast, and in the following year the entire right for the United States, his firm remaining as general agents. As now organized, there are two factories, one in New Jersey and one here, the Eastern division going under the name of the Atlantic Dynamite Company, and this under the name of the Giant Powder Company; but both being managed by one Board of Directors in San Francisco, with Albert Dihhlee as president, Louis B. Chapman as secretary, and Sather & Co. and the London and San Francisco Bank treasurers. Under the management, three kinds of powder are made—Nobel's Explosive Gelatine, the strongest, a brownish-looking article of the consistency of half solidified glue; the Giant Powder, ranking next; and the Judson Powder. After the Giant Powder had been established three or four years, other companies sprung up, notwithstanding the sole rights which the Giant Powder Company had under the Nohel patents. They are all copies or imitations of Nohel's original invention of dynamite, which is simply nitro-glycerine held in an ahsorhing hody. Nitro-glycerine, in its fluid state, is an oil produced hy the mixture of nitric acid, sulphuric acid and glycerine, and is liahle to explosion when transported in that state. Mr. Nohel changed this into a paste or powder, hy which the nitro-glycerine is cushioned, thus making it entirely safe in transportation or handling. As a hlasting agent the fluid would be impracticable, as it could not he used in horizontal or upward boreholes, except hy putting it in tin tubes or some such appliance. The strength of the dynamite or giant powder depends entirely on the amount of nitro-glycerine used, and as it is a very difficult matter to test this, some manufacturers take advantage of this, using less, so that the power of ths article is lesscned. Consumers, therefore, should only deal with such companies in whose honesty they can have no doubt. Two or thres years ago Mr. Nobel succeeded in producing a still stronger powder than the strongest dynamite, as the strength of the latter is limited hy ths ahsorbing qualities of the ahsorhent used. This is called Nohel's explosive gelatine. It contains 94 per cent of nitroglycerine, whereas dynamite cannot safely hold more that 75 per cent. It is even safer in handling and transportation than dynamite, as it requires for its explosion a specially prepared primer, which is exploded hy a giaut powder cap, whereas dynamite explodes with giant powder or heavy percussion caps alone. This gelatine is entirely impervious to water, and, therefore, specially adapted for submarine hlastings. It has been largely used in the last two years on the great tunnels hored in Europe, for instance, the Arlhsrg tunnel in Austria, also the St. Gothard in Switzerland, and has heen found superior hy those intelligent engineers, who performed those great works, to dynamite. The Judson powder is a low explosive, the result of much experimenting. It is three or four times stronger than hlasting powder, and has met with remarkahle snccess in railroad work on account of its superior strength and crushing qualities. For farm work, such as removing stumps, etc., it is invaluahle. Thesc three powders may he ohtained of Bandmann, Nielseu & Co., and we can recommend the house to our readers. The firm has a reputation estahlished since 1849, and is noted for its reliahility. Its goods are offered at reasonable rates, and can hs relied on to he of the strengtb stated. The guarantee of this firm is sufficient, and we commend it to our readers. As formed at the beginning, this firm still exists, consisting of Mr. Julius Bandmaun, and Mr. Henry Nielsen, under the title of Bandmann, Nielsen & Co.

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COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCA'N.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M and M Co	Alaska	8	50	Dec 10	Jan 11	Jan 31	T J Hay	306 Pine st
Alta S M Co	Nevada	31	25	Dec 24	Jan 9	Jan 28	W H Whatson	302 Montgomery st
Arnold M Co	Arizona	3	1 00	Jan 3	Feb 7	Mar 2	A Judson	320 Sansome st
Best & Belcher M Co	Nevada	31	50	Nov 21	Dec 30	Jan 19	W Willis	309 Montgomery st
Black Bear M Co	California	2	25	Dec 20	Jan 25	Feb 20	W L Oliver	328 Montgomery st
Champion M Co	California	17	10	Nov 24	Dec 29	Jan 19	T Wetzel	522 Montgomery st
Con Amador M Co	California	8	30	Dec 3	Jan 5	Jan 21	F B Latham	408 California st
Copper Mt Con M Co	California	1	05	Dec 3	Jan 13	Feb 10	A L Perkins	310 Pine st
Eintracht Gravel M Co	California	17	05	Dec 9	Feh 7	Feh 16	H Kuntz	309 Sansome st
Excelsior M Co	California	9	50	Sept 2	Dec 31	Jan 22	W J Stewart	218 Sansom e st
Exchequer M Co	Nevada	21	20	Jan 2	Feb 5	Feb 26	C C Elliott	309 Montgomery st
Grand Prize M Co	Nevada	17	35	Nov 24	Dec 30	Jan 2	E M Hall	327 Pine st
Happy Valley Gravel M Co	California	5	03	Dec 15	Jan 21	Feb 9	D M Kent	330 Pine st
Hale & Norcross S M Co	Nevada	83	50	Dec 8	Jan 13	Feh 3	F Lightner	309 Montgomery st
Indian Spring Drift M Co	California	4	05	Nov 21	Dec 22	Jan 21	A B Paul	328 Montgomery st
Lewis Con M Co	Arizona	5	03	Nov 14	Dec 22	Jan 19	J W Pew	310 Pine st
Mayflower Gravel M Co	California	27	10	Nov 20	Dec 23	Jan 12	J Morizio	328 Montgomery st
Scorpion S M Co	Nevada	19	10	Dec 1	Jan 9	Jan 13	G R Spinney	310 Pine st
Summer Con M Co	California	2	05	Dec 18	Jan 19	Feb 12	F E Luty	330 Pine st
Silver Lining M Co	Nevada	1	07	Dec 16	Jan 24	Feb 19	J Stadfeld	419 California st
Union Con M Co	Nevada	28	50	Nov 5	Dec 30	Jan 19	J M Buffington	309 California st
Utah S M Co	Nevada	52	50	Dec 19	Jan 26	Feh 14	G C Pratt	309 Montgomery st
Virginia Creek Gravel Co	California	1	20	Dec 20	Jan 25	Mar 2	J M Quay	406 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Argenta M Co	Nevada	E M Hall	327 Pine st	Annual	Jan 12
Crocker M Co	Arizona	Ang Waterman	309 Montgomery st	Annual	Jan 19
Iowa M Co	California	C C Leavitt	510 Battery st	Annual	Jan 13
Kossuth M Co		C K Sturtevant	0328 Montgomery st	Annual	Jan 13
Silver King M Co	Arizona	J Nash	328 Montgomery st	Annual	Jan 13

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	B L Burling	328 Montgomery st	50	Dec 5
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Dec 15
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Oct 8
Jackson M Co	California	D C Bates	309 Montgomery st	10	Dec 27
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Jan 13
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Nov 28
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Jan 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Nov 6

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE. Jan 1-Jan 7	Portland. Rain	Temp	Wind	Weather	Red Bluff. Rain	Temp	Wind	Weather	Sacramento. Rain	Temp	Wind	Weather	S. Francisco. Rain	Temp	Wind	Weather	Los Angeles. Rain	Temp	Wind	Weather	San Diego. Rain	Temp	Wind	Weather
Thursday	.29	23	E	Cy.	.05	42	N	LR.	.02	45	N	LR.	.13	48	E	LR.	.00	56	E	Cl.	.00	58	W	Cl.
Friday	.09	24	—	LR.	.32	47	N	Cl.	.18	44	NW	Cy	.32	47	N	Fr.	.00	57	—	Fr.	.02	57	SW	Cy.
Saturday	.30	46	S	LR.	.00	48	E	Fr.	.00	46	SE	Cy.	.00	48	SE	Cl.	.00	60	SE	Cl.	.07	58	SW	Cl.
Sunday	1.31	47	S	Cy.	.00	48	S	Cy.	.00	43	SE	Fr.	.00	48	NE	Cy.	0	94	SE	Cl	.00	60	W	Cl.
Monday	.05	33	—	LR.	.02	50	N	Cy.	.00	48	N	Fr	.00	52	N	Cy.	00	62	S	Fr	.00	61	SW	Cl.
Tuesday	.34	50	S	Cy.	.00	52	—	Cy.	.00	49	E	Cy.	.00	50	NE	Cy	.00	67	--	Cl.	.00	3	NW	Cl.
Wednesday	.90	52	S	LR.	.07	47	S	Cy.	.00	48	S	Cy.	.—	51	SE	LR.	.00	66	NW	Cl.	.00	62	WN	Cl.
Totals	3.28				.46				.20				.45				.00				.09			

EXPLANATION.—Cl. for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature wind and weather at 11:58 A. M. (San Francisco mean time), with amount of rainfall in the preceding 24 hours

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Dec. 18.		WEEK ENDING Dec. 23.		WEEK ENDING Dec. 31.		WEEK ENDING Jan. 8.	
Alpha	.60	.70	....	....	.65	.70	.80	
Alta	....	.20	.20	.10	.15	.05	.30	
Andes	....	.15	.15	.15	.20	.10	.15	
Argenta	....	....	....	....	....	....	.05	
Belcher	....	.30	....	....	.60	.65	.70	
Belding	....	....	....	....	....	....	....	
Best & Belcher	.80	.85	.80	1.50	1.30	1.45	1.10	1.35
Bullion	....	....	....	.25	....	.25	.20	.25
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	.20	.15	.20	....	.20	....	.15
Bodie Con	1.80	2.10	1.95	2.60	1.90	2.10	1.95	2.10
Benton	....	.05	....	.10	....	.10	.05	.65
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	....	.30	....	....	.20	.50	.25	.35
California	.30	.35	.35	.40	.35	.40	.25	.35
Challenge	....	.10	....	....	....	....	....	.25
Champion	....	....	....	....	....	....	....	....
Chollar	2.40	2.60	2.50	2.75	2.40	2.70	1.70	2.15
Confidence	....	.50	....	.75	....	.75	.85	.90
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.30	.35	.35	.40	.35	.40	.25	.35
Con. Pacific	1.05	1.10	....	1.10	....	1.10	....	1.10
Crown Point	.60	.75	....	....	....	....	.75	.95
Day	....	....	....	....	....	....	....	....
Eureka Con	....	2.40	....	....	1.25	1.80	....	1.15
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	.10	.15	....	.15	....	.15	.05	.15
Grand Prize	....	....	....	....	....	....	....	....
Gould & Curry	1.05	1.15	1.10	1.25	1.10	1.30	.95	1.15
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	2.55	2.85	2.80	4.15	3.65	4.10	3.40	3.75
Holmes	....	4.00	4.25	4.30	4.50	5.00	4.55	4.80
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	.10	.15	....	.15	....	.20	....	....
Martin White	....	....	....	.35	....	.40	....	.35
Mono	.95	1.30	1.15	1.40	1.30	1.55	1.25	1.80
Mexican	.20	.75	.70	.75	.65	.75	.50	.65
Mt. Diablo	3.70	4.00	....	....	3.70	3.75	....	....
Northern Belle	....	....	....	....	....	....	....	....
Navajo	2.00	2.40	1.90	1.95	1.90	2.05	1.85	2.05
North Belle Isle	....	.25	....	....	....	.25	.15	.20
Occidental	.70	.80	....	.75	....	.75	.75	.85
Ophir	.15	.70	.65	.70	.65	.70	.50	.65
Overman	....	....	....	....	....	....	....	.10
Potosi	.80	.90	.80	1.00	.80	1.00	.65	.80
Pinal Con	....	....	....	....	....	....	....	....
Savage	.65	1.30	1.25	1.70	1.60	1.80	1.60	1.80
Sag. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	.70	.75	.75	.85	.70	.80	.60	.75
Silver Hill	....	....	....	....	....	....	....	....
Silver King	....	....	....	.35	....	....	....	.30
Scorpion	....	.05	....	.05	....	.10	.05	.15
Syndicate	....	....	....	.35	....	....	....	.30
Trogs	....	....	....	....	....	....	....	....
Union Con	.60	.70	.65	.70	.55	.70	.50	.60
Utah	....	.50	.35	.45	.15	.40	.15	.20
Yellow Jacket	.70	1.10	....	1.00	1.00	1.15	1.20	1.60
	....	....	....	....	....	....	....	....

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
J. J. BARTELL—Sacramento and San Joaquin Counties.
A. C. KNOX—San Benito and Monterey Counties.
GEO. MCDOWELL—Santa Clara County.
WM. H. COOK—Fresno County.
G. W. INGALLS—Arizona.
W. WHITWELL—Oregon.
M. S. PRIME—Alameda County.
MRS. OZIER—Humboldt County.

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Jan. 8. AFTERNOON SESSION.

100 Alpha	80c	100 Alta	15c
10 Andes	15c	420 Bodie	2.00
10 Bodie Con	2.00	150 Belcher	65c
480 Benton Con	05c	100 Bulwer	25c
250 B. & Belcher	1.30	130 Chollar	1.80
200 Chollar	1.75	20 Eureka Con	1.50
150 Con. Pacific	1.15	300 Exchequer	05c
50 Eureka Con	1.50	600 Gould & Curry	1.15
100 Gould & Curry	1.00	295 Hale & Nor	3.40
300 Hale & Nor	4.00	400 Mono	1.30@1 35
485 Mexican	50@55c	200 Mexican	55c
500 Mono	1.45	1200 N. Belle Is	15@20c
200 Navajo	1.95	140 Navajo	1.95
400 Overman	10c	140 Ophir	50@55c
550 Potosi	75c	20 Occidental	75c
20 Sierra Nevada	65c	300 Potosi	70c
80 Savage	1.65@1.70	50 Sierra Nevada	60c
150 Syndicate	10c	530 Savage	1.60@1.65
150 Solid Silver	25c	25 Utah	10c
100 Union Con	55c	300 Union	55c
440 Yellow Jacket	1.50@1.60	470 Yellow Jacket	1.30@1.55

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Jan. 8, 1885.

ANTIMONY—Per pound		@	—
Hallet's		12½@	—
Cookson's		13½@	—
BORAX—Refined		7½@	8
IRON—Glengarnock ton	23 00	@	—
Eglinton, ton	22 00	@	—
American Soft, ton	25 00	@	—
Oregon Pig, ton		@	—
Clipper Gap, Nos. 1 to 4	25 00	@	30 00
Clay Lane White	23 50	@	—
Shotts, No. 1	26 00	@	—
Refined Bar		3 @	3½
Boiler, 1 to 4	5 00	@	5 50
STEEL—English, lb		16 @	25
Black Diamond, ordinary sizes		13 @	—
Drill		15 @	—
Machinery		12 @	14
COPPER—			
Brazier's sizes		— @	25
Fire-box sheets		28 @	—
Bolt		22 @	—
Yellow Metal		14 @	15
LEAD—Pig		3½@	3¾
Bar		5 @	—
Pipe		7 @	—
Sheet		8 @	—
Shot, discount 10% on 500 bag	Drop, ¼ bag	1 85 @	—
Buck, ¼ bag		2 05 @	-
Chilled, do		2 25 @	-
TINPLATE—Oldcastle		5 25 @	6 00
Charcoal		6 50 @	6 75
I. C.		5 25 @	5 50
Roofing		6 25 @	13 50
ZINC—German		9 @	10
Sheet, 7x3 ft, 7 to 10 lb, less the cask		9 @	10
QUICKSILVER—By the flask		32 50 @	33 00
Flasks, new		1 05 @	—
Flasks, old		85 @	—
NEW YORK PRICES—			
California Borax, refined		8½@	8¾
Pig Iron, American No. 1		18 00 @	18 50
Pig Iron, American No. 2		17 00 @	—
Quicksilver		48 @	50
Lead		3 50 @	3 67½
Copper		11 @	11¾
Bar Silver		1 08½@	

THE LITHOGRAPHER AND PRINTER is one of the most useful and intelligently prepared trades' journal yet published in our country. Its issues have continually improved from the first. Subscription, $3 a year. Address Lithographer Publishing Co., Chicago. Fred. Bnn ring & Co. are proprietors.

List of U. S. Patents for Pacifo Coast Inventors.

[From the official list of U. S. Patents in DEWEY & CO.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING DECEMBER 23, 1884.

309,610.—STEAM ACTUATED VALVE—Geo. E Dow, S. F.

309,787.—EXPLOSIVE COMPOUND—E. Judson, S. F.

309,634.—MECHANICAL MOVEMENT—Lowe, Westgate & Banks, Logan City, A. T.

309,559.—CAR COUPLING—S. T. Northcutt, Brooks, Or.

309,645.—WINDMILL—Orcutt & Wood, Los Angeles, Cal.

309,650.—PLOW—J. O. Rollins, Chico, Cal.

309,671.—CULTIVATOR TOOTH—Jos. Williams, San Jose, Cal.

FOR WEEK ENDING DECEMBER 30, 1884.

309,855.—OATMEAL MILL—Holloway & Hudson, Salinas, Cal.

309,852.—ELLIPSOGRAPH—H. T. Hazard, Los Angeles, Cal.

309,960.—BINNACLE LAMP—J. Keane, S. F.

309,865.—HYDRAULIC GATE AND VALVE—Jos. Moore, S. F.

310,078.—SLED—N. B. Peterson, Seattle, W. T.

310,149.—SEAT, DRAWER, STEP AND SHELVING FOR STORES—F. J. Prolzman, Portland, Or.

310,084.—LOCK—Geo. W. Roberts, Walla Walla, W. T.

309,982.—TUBE STRUCTURE FOR CABLE R. R.—Henry Root, S. F.

309,983.—SWITCHING DEVICE—Henry Root, S. F.

309,997.—EXTENSION LADDER—S. S. Thompson, S. F.

310,100.—JACK SCREW—W. W. Vaughan, Stockton, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently ohtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

ROTARY ENGINE.—John C. Edmunson, Salinas, No. 309,296. Dated Dec. 16, 1884. This engine consists of a pair of annular chambers, each of which has a piston adapted to revolve within it, and hoth pistons are connected hy disks with a single central shaft which extends through the casings of both disks, so that the two operate together. In connection with these chambers and pistons is a valvc chamher, a valve by which steam may he admitted alternately to one chamber or the other, and a means for operating said valve connected with the main engine shaft, vertically moving gates which alternately rise so as to open a passage in the chamher to allow this piston to pass and are closed behind the piston, to act as abutments between which aud the pistons steam may act to drive the latter around in the chambers, and cams and connecting mechanism from the main shaft, by which thesc ahutments are operated.

CABLE-RAILWAY-GRIP MECHANISM.—Isaac Hyde, Oakland, assignee of two-thirds to M. E. Willis and Elon De Witt, S. F., No. 309,506, dated Dec. 16, 1884. This is a novel construction of mechanism for operating the grip, hy which a car is connected with a traveling rope or cahle. It consis s in a peculiar construction, arrangement and comhination of devices difficult to describe intelligently without the aid of detailed drawings. In the ordinary constructiou of grips they are placed hetween the front and rear wbeels of the car and the operating lever projects up nearly in the center. In Mr. Hyde's iuvention the grip mechanism is supported in front of the forward axle, and the operating lever is at the extreme front of the car upon the platform with a jointed connecting device, which prevents the movements of the car-body upon its springs from heing commucicated to the grip mechanism or lever.

STEAM ACTUATED VALVE.—George E. Dow, S. F., No. 309,610. Dated Dec. 23, 1884. This new invention of Mr. Dow's, who is one of our most accomplished mechanics aud inventors, relates to direct acting steam engines, such as are applied more particularly to steam pumps. It consists of a main cylinder with a piston reciprocating therein, a piston-rod connecting the piston with the exterior apparatus to be moved therehy, and a comhination of main and auxiliary valves and corresponding parts, and an auxiliary piston hy which hoth valves are moved, the stem of said valve heing connected hy a mechanism outside of the cylinders with the main piston-rod, so that a positive motion is imparted to the valves, and a bracket and guide for the sliding sleeve, through which motion is communicated to the supplemental or steam-chest piston, with its main aud auxiliary valves from the main piston-rod, together with certain details of comhination. The effect of the improved valve is to cut off the steam from the acting side of the supplemental piston when the valves have moved far enough to fully open the main ports. This makes the exhaust cushion still more effective than hefore, as the steam is cut off from acting npon the opposite end of the supplemental piston.

Market Reports.

Lumber at Wholesale.

The market has been moderately active, though receipts have been light of late. Quotations of cargo rates are as follows for redwood lumber, for delivery at San Francisco, Oakland, Alameda, Berkeley, Vallejo, Benicia, Port Costa, Martinez and Antioch:

ROUGH—No. 1 rough merchantable, $18; No. 2 (refuse) rough, $11; No. 1 rough boards (specified width, 10 inches and over), $19; No. 2 (refuse) do do do, $14; No. 1 rough lumber, surface one side, $21. No. 2 (refuse) do do do $18.

PICKETS—Rough square pickets, $12; rough pointed do, $14; fancy pointed do, $22.

HALF-INCH LUMBER—No. 1 ½-inch surfaced, board measure, $40; No. 2 do do do, $30; No. 3 do do do, $38; No. 4 (refuse) do do do, $32; No. 1 ½-inch battens, board measure, $40; No. 2 (refuse) do do do, $32; No. 1 ½-inch siding, 12 ft. and over, b m, $40; No. 2 (refuse) do do do $32; ½-inch siding, under 12 ft, $32.

RUSTIC—No. 1 Rustic, 1x10, 12 ft and over, $33; No. 2 do do do, $32; No. 3 do do do, $31; No. 4 Rustic, 1x10, $28; No. 5 (refuse) do do do, $21; No. 1 Rustic, 1x8, 12 ft and over, $31; No. 2 do do do, $30; No. 3 do do do, $29; No. 4 Rustic, 1x8, $26; No. 5 refuse) do do, $21.

CLEAR—No. 1 surfaced and rough clear, $32; No. 2 do do do, $31; No. 3 do do do, $30; No. 4 (refuse) do do do, $24; No. 1 surfaced and rough clear, 1x8 and 1x6, $30; No. 2, do do do, $29; No. 3 do do do, $28; No. 4 (refuse) do do do, $24.

Dimensioned, Surfaced and Rough Clear (widths and lengths), 12 inches wide and over, add $1 ₱ M (on each corresponding grade) to the above list price of "Clear."]

TONGUED AND GROOVED—No. 1 T and G, 1x4, 12 feet and over, $32; No. 2 (refuse) do do do, $24; No. 1 T and G, 1x6, 12 ft and over, $30; No. 2 (refuse) do do do, $24; T and G, 1x6, 7 to 11 ft, $26; do do, under 7 ft, $23.

TONGUED, GROOVED AND BEADED—No. 1 T, G and Beaded, 1x4, 1¼x4 and 1¼x6, 12 ft and over, $32; No. 2 (refuse) do do do, $24; T, G and Beaded, 1x4, 1¼x4 and 1x6, 7 to 11 ft, $27; do do, under 7 ft, $22.

ROUGH CLEAR—1x6 and under in width, and under 12 ft in length, $24.

[On a credit of 60 days, or a discount at the rate of 1 per cent per month for anticipated payments, and not less than 1 per cent per month added for extension of the same].

We quote cargo rates—Pine—Merchantable Rough, $15 ₱ M; Flooring, $24.29; Stepping, $37 ₱ M; Redwood—Merchantable Rough, $18; Surfaced, $32; Rough Clear, $32; Rustic, $33; Tongued and Grooved, $30; Tongued, Grooved and Beaded, $32.

Lumber at Retail.

Retail quotations for pine, fir and spruce are as follows:

ROUGH MERCHANTABLE—(Ordinary sizes) to 40 feet long, per M ft, $22.50; Rough Merchantable, 1x6, Fencing, $22.50; do do, 1x4, do, $23.50; do do, 1x3, do, $24.50; do do, 1x4, odd lengths, $22.50; do do, 1x6, do $21.50; do No. 2, all sizes, $18.50; do Selected, $20.50; do Clear, other than for T and G and Stepping, $31.

[Rough Clear for T and G and Stepping $1 ₱M less than price of kind for which intended.]

Dressed T and G Flooring, 1x6, No. 1, vertical grain, ₱ M ft, $38.50; Dressed T and G Flooring, 1x6, No. 1, $33.50; do do do, No. 2, $28.50; Dressed T and G Flooring, 1x3, 1x4, 1¼x4 and over, No. 1, vertical grain, $40.50; do do do, No. 1, $35.50; do do do, No. 2, $30.50; Dressed Stepping, No. 1, vertical grain, $42.50; do do, No. 1, $37.50; do do, No. 2, $28.50.

SPRUCE—Rough Merchantable, ₱ M ft, $21.50; do Clear, $35; Clear Dressed (shelving), $40; Pickets (rough) board measure, $20.50; Furring, 1x2, per lineal ft, 1c; Laths, 1 and 1-½inch, ₱ M, $3.50; 1½-inch, $4.

[N. B.—For all sizes over 11 inches, and lengths over 40 feet, extra rates].

Retail quotations of Redwood are as follows:

ROUGH MERCHANTABLE—₱ M ft, $22.50; do Selected, $27.50; do No. 2, $18.50; Surface, No. 1 and Rough Clear, $40; do, 1x6, $37.50; do, No. 2, $30; Rustic, No. 1, 1x8, $37.50; do, No. 1, 1x10, $40; do, No. 2, $35; do, under 10ft, $35; T and G Redwood, 1x4, 1¼x4 and 1¼x6, $39; do do, 6-inch, 12 ft and over, $37.50; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; do do do, No. 2, $30; do do, Beaded, 12 ft and over, $40; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; Half-inch Surface, $32.50; Pickets, Fancy, $30; do, Rough, pointed, $20; do do, square, $17.50; Siding, ½-inch, $27.50; Battens, ½-inch, per lineal ft, 1c; Shingles, ₱ M, $2.50; Shakes, Split, $14; do, Sawed, $12; Posts, per piece, 13c; Dressed Boards, ₱ M ft, $25.

On a credit of 60 days or less, or a discount of two (2) per cent for cash only. On all credits exceeding 60 days' time, not less than one (1) per cent per month to be added.

Under the rules of the Exchange, no "lump" sum will be given on any bill of lumber.

Nails.

We give the price list of the Pacific Iron and Nail Company.

FENCE AND BRAD.—10d to 60d, $2.75; 8d and 9d, $3.00; 6d and 7d, $3.25 4d and 5d, $3.50; 3d, $4.25; 2d, $5.50.

BARREL.—¾ inch, $6.75; ⅞ inch, $5.75; 1 inch, $5.25; 1¼ inch, $4.50; 1½ inch, $4.25; 1⅔ inch, $3.75; 1¾ inch, $3.50.

LINING.—¾ inch, $7.25; ⅞ inch, $4.75.

TOBACCO.—10d, $3.25 8d, $3.50; 6d to 7d, $3.75.

CLINCH.—6d to 30d, $4.50.

SLATING.—5d, $3.75; 4d, $3.75; 3d, $4.50; 2d, $5.75.

FINISHING.—2d, 1 inch, $8.75; 3d, 1¼ inch, $6.75; 4d, 1½ to 1¾ inch, $4.50; 6d, 2 inch, $4.25; 8d, 2½ inch, $4.00; 10d, 3 inch and over, $3.75.

CASING AND BOX.—10d to 30d, $3.50; 8d, $3.75; 6d, $8.00; 4d, $4.25; 3d, $5.25.

FINE BRIGHT.—4d, $4.50; 3d, $5.75; 2d, $6.50.

CUT SPIKES.—All sizes, $3.00.

BOAT SPIKES.—All sizes, $3.50.

Each half keg 10 cents extra.

TERMS.—Note or acceptance at 60 days with current rate of Exchange on S. F., or a discount of 2 per cent for cash, if remitted within 10 days from date of invoice.

All accounts when due subject to sight draft without notice.

An abatement of 10 cents per keg will be allowed upon orders of 200 kegs or over.

Building Material.

Lime, per barrel, $1.50@$1.00. Plaster, $2.75-3.00. Eastern Plaster, $3.00–3.25. Rosendale Cement, $2.25–2.75. Portland Cement, $3.50-3.75. Fire Brick, per 1,000, $40 @ $45, according to brand; hard, $10.00@$12,00; red, $8.00@$8.50; soft, $7.50; face, $30.00.

Bullion Shipments.

Christy, Dec. 31, $5,109; Syndicate, 31, $6,600; Argus, Jan. 2, $11,696; Oro Grande, 2, $7,781; Alhambra, 2, $15,210; Germania, Dec. 30, $5,314; Hanauer, 30, $5,200; Nevada, 30, $1,100; Idaho ore, 30, $2,830; Germania, 31, $5,366; Queen of the Hills, 31, $2,800; Hanauer, 31, $2,600; Horn Silver, 31, $7,500; Vienna, 31, $1,970; Germania, Jan. 3, $3,489; Horn Silver, 3, $15,000; Minnie Moore, 3, $5,380; Stormont, 3, $2,960; Crescent, 3, $3,100; Hanauer, 3, $5,100; Ontario, 4, $14,830; Christy, 4, $1,700. The banks of Salt Lake City report the receipt by them for the week ending December 31st, of $156,091.84 in bullion, and $24,876 in ore; a total of $180,967.84

Mining Share Market.

Prices continue rather low in the stock market. Attention is being turned now by mining men and stock operators to the progress of work on the upper levels of the Comstock. At the north end they have now commenced prospecting these levels. They are working on the 2500 level of the Sierra Nevada, and on the 2700 level of the Union Con. The water will now soon be drained out of the ground lying above the 500 level of the Ophir, when a large amount of ground will be opened that is thought to contain much low-grade ore that can be worked to a profit. This ground has not been worked since the early days, on account of it being flooded with water which did not permit tributers to work below the 250 level. As the 250 level has yielded a large amount of ore that has paid for working, much more and better ore should be found on the 500 level, where the ground has not been gonged by tributers. At Gold Hill the Yellow Jacket, Belcher and Crown Point are taking out the usual amount of low grade ore, keeping the mills on the Carson river in full blast. There is a good stage of water in the river and the mills can be run to their full capacity.

News in Brief.

THE snow blockade on the Oregon Railway and Navigation Road still continues.

CONGRESS will be asked to make an appropriation of $100,000 for Yellowstone Park this year.

THE exports of lumber from Burrard inlet, B. C., in 1884, were 29,000,000 feet in forty-four ships.

THE New York elevated railways carried 96,702,620 passengers last year, and had a net profit of $289,697.24.

THE Louisiana sugar planters are feeling very gloomy over the outlook. The result of the season just closed was very disastrous.

THE steamship *Oregon* has again lowered the record, making the passage from New York to Queenstown in six days, six hours and fifty-two minutes.

MINNEAPOLIS millers are selling flour in Canada for less than the price of Canadian wheat, and this has caused large mills at Winnipeg to shut down.

TWO troops of cavalry are on the way to expel Captain Crouch and a party of boomers from Indian Territory. Crouch's men say they will resist the troops.

ADVICES from Kartoum to the end of November state that General Gordon had repulsed several minor attacks, and had food and ammunition for several months.

THE German expedition to explore the African interior has returned to Amburg, Guinea, on the west coast of Africa. The natives refused to allow the expedition to proceed.

THE results of the earthquake in Spain show that it was even more terrible than at first reported. The loss to the town of Malaga exceeds $500,000. Two hundred and twenty-seven houses were damaged.

THE New York *Commercial Bulletin* estimates the loss by fire in the United States and Canada for December at $11,000,000, and for the year at $112,000,000. This is $15,500,000 more than the average loss for the nine years preceding.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if t is continued, through the failure of the subscriber to notify us to discontinue it, or some responsible party requested to stop it, we shall positively demand payment for the time it is sent.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

ASSESSMENT NOTICE.

Fremont Mining and Milling Company.—Location of principal place of business, San Francisco, Cal. Location of works, Amador county, near Drytown, Cal.

NOTICE is hereby given that at a meeting of the Trustees, held on the twenty ninth day of December, 1884, an assessment (No. 1) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, No. 402 Front street, room 8, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the fourth day of February, 1885, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday the twenty-seventh day of February, 1885, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

MARK T. ASHBY, Sec'y.

OFFICE No. 402 Front St., Room 8, San Francisco, Cal.

The World's Industrial and Cotton Centennial Exposition

Will be open for Six Months, beginning 16th day of December, 1884.

The display will embrace such a varied and comprehensive collection of the works of nature and art as it is possible for human enterprise to gather.

From the applications already received and entries made, the magnitude of the exhibit will exceed that of any Exposition ever held.

The exhibits of the Departments of the General Government, for which $300,000 was appropriated by Congress, will be the largest and most complete ever made. These exhibits, in conjunction with the State and Territorial Collective Exhibits and Educational display, will occupy the full space of the second largest building of the Exposition—one of the very largest ever erected—885 feet by 565 feet.

The displays in the Horticultural department, in Agriculture and in the Live Stock department, will be of equal, if not greater, magnitude than if separate and distinctive exhibitions were given.

The Mexican and Central American Exhibits will possess unusual interest from their variety, uniqueness and historical value.

In the line of Manufactures and Arts, and in natural products, the Exposition will be memorable—excelling all previous efforts.

The principal structures of the Exposition are:

The Main Building—1,378x905 feet—the largest ever erected. To Machinery Hall, which forms a portion of the Main Building, and is 1,378 feet long by 300 feet wide, an extension of 350x120 feet has been added for the special uses of Factories and Mills' Machinery, making Machinery Hall 1,728 feet long by a width of 300 feet—nearly its whole length.

The U. S. and State Exhibits, 885x565 feet.

The Horticultural Hall, 090 feet long by 191 feet wide, in center.

The Art Gallery, 250x100 feet.

The Mexican National Exhibit, Octagonal, 80 feet cross section.

The Mexican National Headquarters, 300x100.

The Grand Rapids (Mich.) Furniture Pavilion, 172x172 feet.

Saw Mill Buildings, 090 feet long.

Live Stock Quarters and various other minor Buildings.

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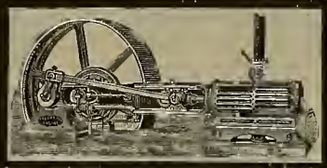
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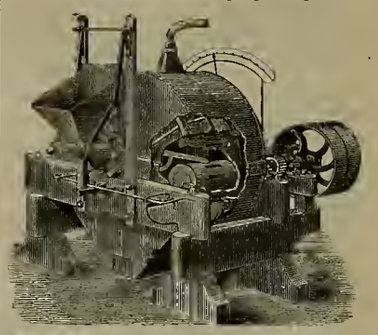
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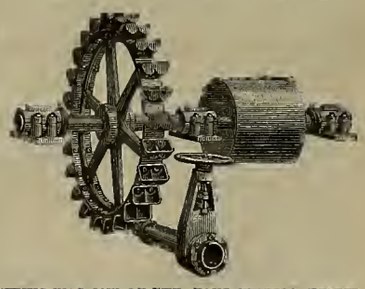
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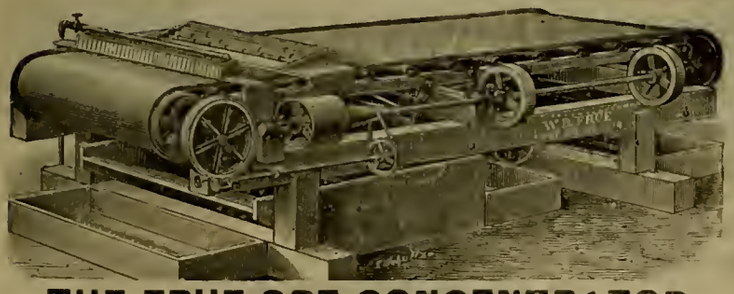

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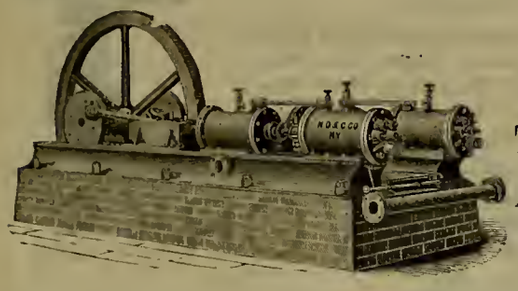

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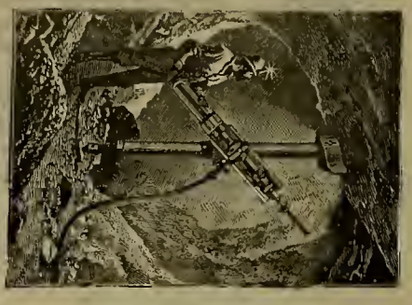

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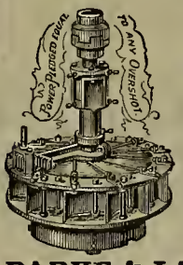

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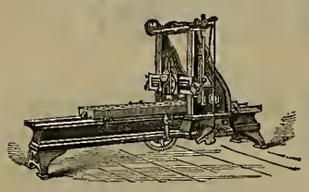

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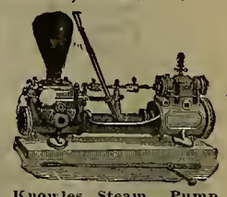

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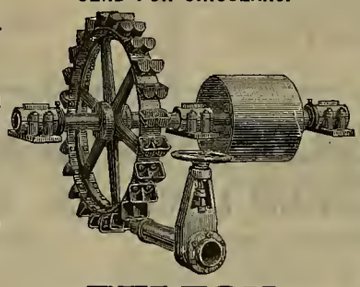

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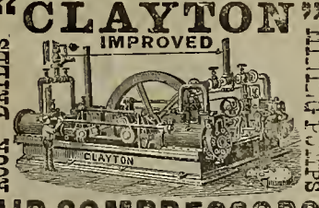

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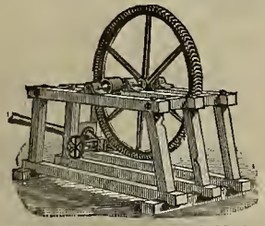

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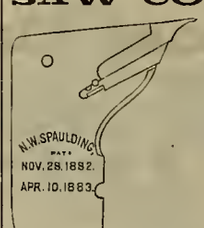

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SAN FRANCISCO, SATURDAY, JANUARY 17, 1885.

VOLUME XLXX. Number 3.

The Embrey Ore Concentrator.

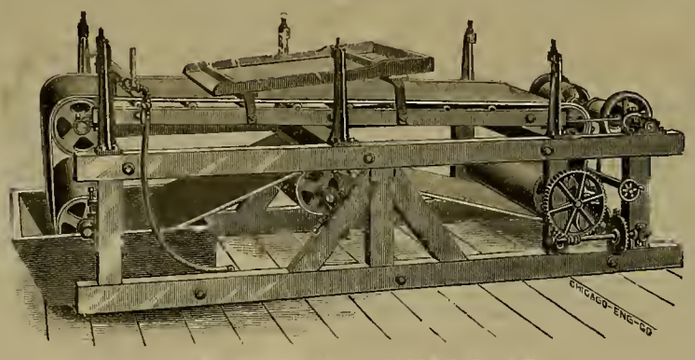
This machine originated in an attempt to obtain something closely resembling the successful Frue Vanner. It was first made known in 1881, and has since been itself imitated in California by a machine which combining the movements of the Embrey with the construction of the Vanner, it is offered as a novel machine, with, of course, vastly increased (?) capabilities.

The Embrey Concentrator has been greatly improved in construction by its present makers, the improvements being based on some ten years' experience in the manufacture of the Vanners. It is made in two forms, one following closely the construction of the Vanner, but with *iron frame* to withstand the increased strain of faster running required with the end shake; the other form is built with a wooden frame, and the driving gear is placed at one end of the machine instead of under the shaking frame. The engravings on this page show the appearance of both forms.

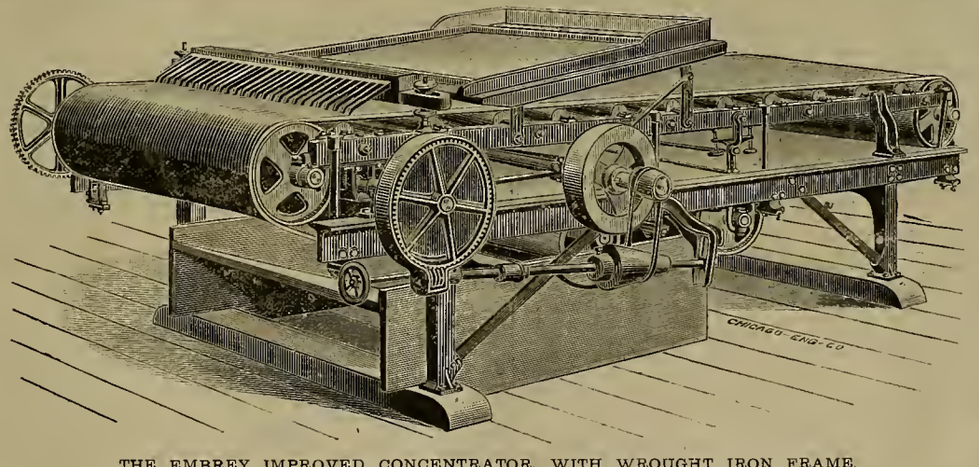
The iron frame machine is neater and more compact in style than the other. The frame is of wrought iron strongly braced, and preferable to castings for transportation, both in weight and freedom from breakage.

The wooden frame machine is, however, much preferable for steady work. The driving gear is not crowded under the moving parts, but it freely within reach while in motion, a great advantage in a quick running machine, with which stoppages are injurious, and regularity of motion imperative. Another great advantage is the reduced moving weight carried by the shaking frame, which is relieved of the two lower rollers, and nearly one-half of the weight of the belt itself. This reduction in moving weight, reduces the power required, and greatly decreases wear and tear.

Both of these machines are supplied with the special rubber belts, so well known on the Frue concentrators, and the durability of which is beyond a doubt. For gold mills, the machines are fitted with a perfect amalgam saving appliance, similiar to those used on the Frue vanners in the Little Annie Mill, Colorado, where there is collected daily by them, from $150 to $200 per day, in amalgam. The public is warned against imitations of this machine. Circulars can be obtained from Messrs. Adams & Carter, 109 California street, San Francisco, or at the office of the Frue Vanning Machine Co., 2, Wall street, New York.



CONCENTRATOR AND WOODEN FRAME.



THE EMBREY IMPROVED CONCENTRATOR, WITH WROUGHT IRON FRAME.

Eastern capitalists are examining the Clark's Fork mines, Montana. The mines so far discovered prospect very high, the major portion of them yielding ore which averages from 40 to 250 ounces. A railroad has been talked of, the ground surveyed, and preparations made for its completion the coming season. The mines are situated but 20 miles from the Yellowstone river, and are easily reached and worked. A tunnel, 300 feet in length, is now being run to tap the main ledge of one of the principal mines, at a depth of 250 feet from the surface.

The Technical Society.

At the last meeting of the Technical Society of the Pacific Coast, vice-president Geo. Specht presided.

Aug. J. Bowie, Jr., read a very interesting paper on "The Destruction of the English Dam," which we shall publish at an early date. The data given by Mr. Bowie on the subject of the flow of a large body of water suddenly released, formed the most interesting and valuable portion of his paper. Maps and drawings were shown to illustrate his remarks.

Mr. Fr. Gutzkow read a paper on "John Reynolds' Process of Bar Refining," showing how the invention of a California workman had revolutionized the process of refining all over the world. We shall publish this paper when it appears in the transactions of the Society.

Mr. Bowie, on behalf of the Committee on Measurement of Water, presented a report recommending that the Legislature be memorialized, or the subject of establishing a unit for the measurement of water in this State, and that suitable experiments be made to establish the unit. The committee was empowered to forward a memorial to the Legislature.

The paper by Mr. Jenssen, read at a previous meeting, on the subject of "The Causes of Explosions in the manufacture of High Explosives," was discussed by the members, the discussion bringing out many valuable facts.

The nominating committee reported the following regular ticket for officers for the ensuing year: president, Col. Geo. H. Mendell; vice-president, Geo. J. Specht; secretary, Chas. G. Yale; treasurer, Geo. W. Percy; Board of Direction, Seth Babson, Fr. Gutzkow, J. D. Schuyler, Aug. J. Bowie, Jr., Geo. W. Dickie.

Text Book of Commercial Law.—A very handy text-book of commercial laws as existing in California, by F. J. Varsault, attorney-at law, has been published by Heald's Business College, of this city. It is designed for use in commercial schools, and by business men. The point of view is that of the merchant and not of the lawyer, therefore, scientific arrangement has given way to simplicity. It gives in plain and simple form those general principles of law as existing in California, a knowledge of which is necessary to every business man. The volume comprises about 120 pages with a carefully arranged index.

At the annual election of the S. F. Stock and Exchange Board, the retiring President, George T. Marye, Jr., sent a communication, in which he stated, that while the palmy days of the Comstock are over, rich developments may be expected, and that at present the indications on the 3,000 level are as good as they were near the surface. He believed that San Francisco is and will remain the center of the mining industry in this country.

The *Sentinel* says that during the year 1884, the Tybo Mining Company shipped bullion valued at $13,000.

An Adjustable Screen for Stamp Batteries.

George Massu and Filomeno Fernandez, of Mazatlan, Mexico, have secured a patent through the Mining and Scientific Press Patent Agency for an improved means for adjusting the screens of mortars for stamp mills, whereby they are adapted to be raised and lowered according to the state of the dies, whether new or worn. The object of the invention is to so arrange the screens that they may be raised for new dies or lowered as the said dies wear out, in order to keep them at a stated or fixed hight above the dies, and that the discharge of the pulp may be effected to the best advantage.

The mortar bed is left open in front for a single-discharge mortar, and open both in front and back for a double-discharge. In the open front of the mortar is left but a toe across it to hold the dies in place. The screen rests on the top edge of a wrought-iron movable or adjustable plate, which is dressed or faced on the planer, as is also the face of the mortar bed.

Both the screen and movable plates are held water-tight against the mortar bed by the following means: First, by two wedges, two angle-irons, and two cast-iron sledges or guides, planed and riveted to the jaws, extending from the mortar and to the housing, which housing may be made either of sheet-iron or cast together with the mortar bed proper. In order to secure the tightening of the wedges equally against the screen and movable plate, the latter is provided with two cast-iron liners, planed and riveted to the plate in order to make up for the difference of thickness between the frame of the screen and the movable plates; second, by three screws fitted with small wheels or spurs. These screws work into a cast-iron cross-piece, held between the projecting jaws of the mortar.

By means of a yoke and screw working through a nut fitted in a bracket, the movable plate and screw can be lowered or raised. The bracket is open in front, and provided with a pin to prevent the yoke from falling off, and the extremities of the legs of the yoke are made to fit into two cast-iron brackets riveted to the movable plate. This plate bears also a small wrought-iron bracket and wedge, to tighten the screw against the plate.

After the screw has been regulated according to the hight of dies, the yoke, nut and bracket can be taken out by removing the above named parts, to be replaced again when a new setting of the screen is required. A trough is riveted to the movable plate, to receive the pulp, which is afterwards delivered to the tanks through a round, cast-iron spout. By means of the screw and yoke the screen can be raised or lowered to suit the state of wear of the dies.

The Hailey *Times* reckons that Wood River has produced eleven millions in bullion the past four years, putting the yield of 1884 at four millions, and estimates the product for 1885 at seven millions.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS

Notes from Churchill County, Nevada.

Nickel and Cobalt in Paying Quantity—Some Promising Silver Mines.

[From our traveling correspondent.]

Lovelock, on the line of the Central Pacific Railroad, is the shipping point for an interesting mining section, which is just now beginning to attract attention.

The districts lie south and east, dis ant 20 to 40 miles from the station. As yet but little work bas been on the base metal and silver claims. In some cases they are getting ready for thorough prospecting, while in others exploitation is being vigorously carried forward in connection with the extraction of ores for shipment or for reduction on the ground.

The Silver Hill Mining Co..

In Pike Holland District, consisting of Messrs. Allen, Whiteman and others, are interested in several locations, many of them thought to be very encouraging prospects in view of present developments.

The Lady Washington

Is reported to be four feet in width and easily worked, the ore assaying up into the hundreds, but estimated to work at the lowest about $80 per ton in silver as it comes from the ledge. Water is found in abundance and wood is plentiful—large enough for timbering. A mill is now on the ground in process of erection, which will start up when finished.

Messrs. Fergison, Ingraham and Calvert have a location on the same range. They have a two-foot ledge of very rich ore—a test in a small way is said to show a result as high as $600 per ton. It is thought safe to put the average working value of the ore at $180 a ton in silver and lead. Men will be set at work immediately.

The Black Hawk, in I. X. L. district, 35 miles from Lovelock, owned by Mr. Kellog, is represented as a base metal ledge with immense croppings of the ore, that will probably pay $100 per ton. It is understood that smelting works will be put up in the spring.

Cobalt and Nickel Mines.

A discovery of nickel ore was made upwards of 20 years ago in Cottonwood Canyon, Churchill county, about 40 miles east of Lovelock station. At that time little was known here of the metal. No one was found capable of a correct assay or analysis of the ore, to say nothing of the more difficult task of reduction, so that it is only very recently that the value and importance of the find are beginning to be fully realized. The first shipment from one of the mines a few months ago was so very favorable in character as to infuse new life and energy into the whole district.

The London mine, located by Mr. Geo. Lovelock as early as 1861, has lately been incorporated. The stock is now owned by Messrs. Bell, Mason and others, of Oakland, Cal.

The developments are mainly by tunnels, one of 200 feet following the ore and penetrating the mountain to the depth of 100 feet from the surface. There are several parallel veins, varying in width from 6 inches to 3 feet, and from 50 to 100 feet apart. The ore in the veins proper carries 4 per cent cobalt, 20 per cent arsenic and 30 per cent nickel, while the whole of the belt, for 300 feet in width, is said to be vein matter, with from 3 to 4 per cent in nickel and 20 per cent in arsenic. As arsenic brings 15 cents per pound in Birmingham, Eng., nickel about 54 cents and cobalt as high as $1, it is thought that the whole of this ground can be made to pay by concentrating 6 tons into 1 ton of matte before shipping. To this end the company are now preparing to erect a furnace. The British Queen and the Monarch, owned by a Chicago company, and adjoining the London, have had only a small amount of work in the way of development, but show large deposits of ore near the surface, much of it standing up from 600 to 700 feet above the surrounding country.

The Emperor, the President and the Empire, recently bonded by Mr. Geo. Lovelock to Messrs. Keys & Husch, of your city, lie on the same belt, immediately west of the Monarch.

Upwards of 50 tons of ore have been shipped to Liverpool, since the 1st of May last.

It yielded from 10 to 12 per cent in cobalt, 10 per cent in nickel, and 25 per cent in arsenic, which, at the prices above given, must have paid well after deducting expense of shipping and reducing. The whole belt carries fully four per cent and upwards of these metals, and is believed as before stated, to be a paying proposition, if properly concentrated.

The Emperor has a cross-cut of 110 feet, through low-grade ore, and another of 120 feet through 8 feet of fine ore, such as is now being shipped.

The President and the Empire carry ore bodies, giving seven per cent in cobalt, and eight per cent in nickel, from all of which it must be evident that the outlook for this portion of Nevada has never been more flattering.

In addition, many locations are now idle, awaiting cheaper transportation, or better facilities for concentrating the ores for reduction at the mines.

A. C. K.

Lovelock.

The National Silver Convention.

All the State will send delegates to the National Convention of Silver Producers, which meets at Denver, Col., on the 28th inst. Invitations have been sent to the Governors of the silver-producing States. The following is a copy of the invitation to he represented in the Convention.

HEADQUARTERS CLEAR CREEK CO.
SILVER ASS'N., GEORGETOWN, COL.

To His Excellency, Governor ——:

The signers of the call, herewith, for a State and National Silver Convention, who are representative men of different political affiliations, residents in 19 counties in this State, delegated to the undersigned the authority to perform the duties of a State Executive Committee, until our State Convention assembles, and a State organization is perfected.

In this capacity, we respectfully invite your attention to the following call for a State and National Convention, to meet at Denver, Colorado, January 28, 1885, and extend you a cordial invitation to he present on that occasion, and participate in the deliberations. We also through you urgently request the attendance of as many of the friends of silver from your State, as you may appoint, or as may he elected by State or County Conventions, or otherwise, as they may elect. It is earnestly desired that every State and Territory in the United States shall be well represented at the Convention, the entire country being interested either in the production or circulation of silver as money, and united action being necessary for its protection and restoration to its former relative position, as a money metal, with gold.

D. B. HARRIS, Ch'n.
J. M. S. EGAN, Secy.
H. A. MEARS.
C. C. POST.
P. M. HANSBROUGH.

The address on this subject, issued at Georgetown, Col., is as follows:

To the silver producers and all who favor its free and unlimited coinage throughout the United States and Territories.

In the face of abundant agricultural crops throughout the country, the cry is heard from all parts of the United States that times a e hard, confidence is unsettled in financial circles, and money is hoarded by the hanks and individual lenders, instead of circulating among the people. The cause of this is from the fact that an insufficient supply of money exists, and the people are compelled to transact too great a proportion of their business on a credit. Under the existing laws of congress, 25.80 grains of gold, nine-tenths fine, containiug 23.22 grains of pure gold, constitute a dollar, and 412.50 grains of silver nine-tenths fine, containing 371.25 grains of pure silver, constitute a dollar, and the producers or owners of pure gold can take it to the United States mints in unlimited amounts and have it coined into money by paying the cost of the alloy, the expense to the government for getting the coined gold into circulation being only the mintage. While the coinage of silver is limited to not less than $2,000,000, and not to exceed $4,000,000 per month, and instead of coining it on the same footing that gold is coined, the governor purchases it outright and keeps it out of circulation by locking it up in its vaults.

Since the law was enacted, in 1878, limitiug the coinage of silver, its annual production has been from $37,000,000 to $48,000,000 actual value, and the annual coinage about $28,000,000 coin value, or $24,000,000 actual value, after deducting the loss of about 15 per cent, sustained by the producers.

The annual loss to the producers on the entire product of the country aggregates $6,000,000 to $7,000,000 by reason of this unjust legislation against silver, and aside from the loss to the entire people by retarding its production and circulation, the expense sustained by the government is practically about $24,000,000 annually, which would cease, and this amount would be saved to the people, and could he applied to other purposes if individual coinage of silver prevailed as formerly. Besides, with individual coinage the silver would go into circulation from the hands of the producers as fast as it is coined, and the price being advanced its production and coinage would be doubled in a very short period, thereby stimulating all other business enterprises and benefiting the whole people.

The rapidly increasing population and more extended commerce, together with the falling off in the production of gold from year to year, and the constantly increasing amount of gold used in the arts and manufactures, are potent reasons for increasing the coinage and circulation of silver.

The opponents of silver money tell us that to coin money free and unlimited would induce foreign silver to flow to the United States by reason of its enhanced value here, and the foreigners would realize an average profit of 15 cents on the dollar, but they fail to tell us that the coinage of foreign silver would cost the government only the mintage, and being worth more here with the United States stamp upon it than it would be in other countries as bullion, it would remain in circulation in this country.

In 1878 Reuben E. Fenton, W. S. Groesback and Francis A. Walker attended the International Monetary Conference at Paris, France, as commissioners from the United States, and in 1881 Allen G. Thurman, William M. Everts and Timothy O. Howe attended a similar conference at the same place. At both conferences the efforts of the friends of silver availed nothing; the representatives in attendance from monarchical and despotic governments not acceding to the demands of those from France and the United States. Hence we should not longer hope for the recognition of silver by foreign countries by any united action. But the United States, being the largest silver producing country in the world, should take the lead in the matter of coinage, and if the great flow of silver to this country occurs that is claimed by the mono-metalists who are so agitated from fear that the people will prosper, then an import duty might be placed upon it, as is now the case with iron, lead and other metals.

In view of these and numerous other facts the undersigned citizens of Colorado, realizing the impor ance of thorough organization and united action for the protection and advancement of the silver interests of the entire country, hereby call a State convention to meet at Denver Colorado, Wednesday, January 28, 1885, at 2 o'clock P. M. The object of the convention will he to take such action as will influence the two Houses of Congress and the President, to coin silver free and unlimited and restore it to its former relative value with gold, and also to act on any other measures that may properly come before it.

It is important that every county in Colorado shall be fully represented, and the citizens of each county, irrespective of party, are urgently requested to hold conventions at their respective county seats, Saturday evening, January 17, 1885, and elect at least as many delegates to the State Convention as they sent to the Democratic or Republican State Conventions in 1884.

The friends of silver in all the other States and Territories, whether silver producers or not, are earnestly invited to attend this Convention as delegates, or otherwise, where it is not practical to hold conventions and elect delegates, and to participate in its deliberations, thereby merging it into a National Convention.

H. A. W. Tabor, T. M. Patterson, Arapahoe county.

T. R. Owen, J. M. North, Joseph Wolff, Boulder county.

Henry Paul, W. M. Fletcher, D. B. Harris, H. H. Atkins, C. R. Fish, J. A. Van Auken, G. W. Hall, R. S. Morrison, Clear Creek county.

L. W. Wells, J. H. Craig, George Ratcliff, G. A. Triplett, Douglas county.

J. B. King, L. Ramsey, S. S. Lendholm, D. H. Wood, Elbert county.

James Collins, Harley B. Morse, Gilpin county.

E. M. Harmon, W. J. Warren, John Barbee, Jr., Grand county.

C. S. Thomas, Tingley S. Wood, J. R. Loker, Lake county.

A. F. Howes, E. A. Ballard, Ansel Watrous, Larimer county.

W. C. Chapman, La Plata county.

D. C. Hartwell, Charles Munn, J. M. Jardine, D. F. Day, Ouray county.

John E. Devlin, Jr., D. G. Yokum, E. N. Keables, J. G. Brooks, James Moynahan, Park county.

Thos. A. Rucker, James W. Tanfield, J. P. Mason, A. P. Mackey, Pitkin county.

Alva Adams, A. Eilers, A. W. Geist, Pueblo county.

B. O. Driscoll, J. A. Baird, L. F. Hollingsworth, San Juan county.

F. J. Morgenson, M. J. Alkire, San Miguel county.

H. R. Steele, W. T. Lewis, Thos. Cunningham, Summit county.

J. F. Frankey, Edward F. Colhorn, T. J. Maloney, Marion S. Waller, Gunnison county.

Adair Wilson, Rio Grande county.

THE MENACE TO SILVER MINES.—The banking class of people in the Eastern States are exerting their influence through a venal press and certain facile public men of both political parties at Washington to destroy our silver mining industry, by stopping the coinage of silver in the United States Mints. If this is done our mines will become worthless, and it is high time that conventions he called throughout the State of Nevada, for the purpose of memorializing both Houses of Congress to do all that can and should he done to preserve our silver interests and improve rather than demoralize an industry without which this State cannot exist. Our State legislators also must not forget during the present session to take prompt action for the purpose of heading off the rapidlly growing strength of the anti-silver class of traitors in the East.—*Eureka Sentinel.*

GAS ENGINES WORKED BY THE DOWSON GAS.—Messrs. Crossley Brothers, of Manchester, whose new works at Newton Heath are driven throughout hy eight large Otto gas engines, developing about 150-horse power, worked by the Dowson gas, bave taken out returns of the consumption of coal over a period of 35 weeks, with the result that, including the waste on Sundays of about 500 cwt. for keeping the fire of the Dowson producer going, they find the consumption does not exceed 1.3 pounds of coal per horse-power per hour. We may add that Messrs. Crossley have just completed an Otto engine to indicate 90 horse-power, which is the largest gas engine ever made in this country. It is one of the new double-cylinder engines with a very ingenious valve arrangement.—*Colliery Guardian.*

California Quartz Mines.

Although hydraulic mining, says the Grass Valley *Union*, has been placed under a cloud by the litigation against it for the past few years, and unfavorable decisions of the courts, and investment in and development of that character of mining property has virtually ceased, yet the quartz mining industry has been growing apace in California, and to-day stands on a better footing than at any previous time in the history of the State. In saying this we do not overlook the fact that quartz properties once of note have now no standing, and that all over the mining regions are to be found partially developed quartz mines that are idle, or prospect holes that show where money and labor was thrown away. We know that there have been many and costly failures in quartz mining, and from the fact that all quartz veins cannot he prolific gold-bearers, there will be failures in the future; yet experience has been a good teacher, and imparted knowledge where ignorance once existed, and improvements in machinery and a better knowledge of working ores has done much in late years in giving a reliability to quar z mining that it did not possess in earlier years, when there was a general inexperience as to the characteristics of mineral-bearing veins, and a woful lack of knowledge in properly manipulating the ores. Early quartz mining was attended with great expense, and only because of the richness of many veins was it possible to obtain a profit when there was such an absence of skill and economy. Quartz miners have learned, however, that gold-bearing veins are not rich as a rule, but are yet sufficiently reliable, in a majority of cases, to yield a profit, if the same prudence and intelligence is used as is necessary in other trades and industries. This has been so well demonstrated that of late years quartz mining has grown into much larger dimensions than is generally supposed, not through the agency of corporations that figure in the stock markets, but mainly through local or individual enterprise, until there are now in all parts of the mining regions quartz mines that are being worked regularly and with a profit, but whose output is not a matter of publication any more than would be the details of other private business. It is but necessary to point to the fact that quartz mining, which has always been an important business in Nevada county, has grown much in two years, and a number of new enterprises of the kind are now being entered upon. Sierra county, which is ribbed with quartz ledges, long neglected, is coming to the front as one of the richest and most important quartz mining regions in the State. Plumas and Shasta have now profitable quartz mining where a few years ago little was doing. Quartz mining has made substantial anvances in Placer and El Dorado county, and Amador county still holds the second place to Nevada, while in Calaveras and Tuolumne the dead placer camps are taking on new life from the influence of the stamping batteries. In the far South, in the Calico district, a rich and extensive field is being opened, and now from the far North, in Trinity, comes the promise of quartz discoveries of valuable and permaneut character. The growth of quartz mining in the State has not escaped the attention of mining men, and is having the effect of lessening the dispositiou to seeek regions which have their greatest glamour of richness the more distant they may be, and cause them to invest in California mines, which, though not promising such rich returns, yet are found to be reliable if intelligently and economically worked. With the present year there will he a decided advance in the quartz business, and the future output from this source of mining is destined to show a regular and healthful increase.

GRUB STAKE THEM.—Winter has set in, and a number of miners who are out of work are anxious to find shelter through the season. Many a hardy fellow in this camp, although very willing to work that has not succeeded in finding employment, is willing to take chances with the mine owner, could he but secure grub and cabin to live in during the stormy period. Never was the time more propitious for the owners of small mines. Get on to a few worthy fellows, furnish them a cabin and grub through the winter, and give them a liberal share of the ore they discover, and the chances are that by the opening of spring you will have a mine where now you have little better than a hole in the ground to-day.—*Eureka Sentinel.*

CAMPBELL PROCESS.—The Idaho Springs (Col.) *Gazette* says: The Pacific Reduction Company, of this place, who are working the Campbell process, have shipped about a ton and a half of good bullion, which assayed over $400 per ton. This is considered excellent results, when it should be taken into consideration that they have not treated any ore which would assay over 15 or 20 dollars a ton. Perhaps this much abused process will eventually prove a blessing. We hope for its success. Our miners could get a better price for their ores, and it will he the means of making Idaho Springs an important smelting point.

SUPERIOR BLANKETS are now being woven out of cow hair.

MECHANICAL PROGRESS.

The Inventor and the Machinist.

In the production of every machine two talents are brought into requisition—the inventive talent and the mechanical talent. The inventor and machinist may be one and the same person, but it is more frequently the case that the inventor is not a machinist, and the latter not an inventor in the broad acceptation of that term. The skill requisite to plan and devise a machine is of a far different order from that required to fashion its parts and to assemble them. The inventor deals with ideas, with great mechanical principles. His is a work of discovery—a logical proceeding dealing with causes and effects. It is not absolutely necessary that he be able to make a single part of the machine which he invents, although it were better could he do so, and the more familiar he is with the details of mechanical construction, the easier is it for him to accomplish his desired ends. A true inventor reads a machine as he would a book. His eye takes in every part with a glance, and the objects and purposes of the machine are as clear as day to him.

The machinist, on the other hand, may work for weeks on the separate parts of a machine, and yet not know the true principle upon which it is constructed. He may be able to do his own work with skill, which work may be perfectly adapted to the object intended, and may be fashioned and fitted with the utmost accuracy and bear a finish that rivals the best workmanship; and still he may not have a clear conception of the purposes for which it is adapted. We are speaking of machinists whose mechanical skill exceeds their inventive ability. Such machinists are perhaps good workmen, understanding in a general way the ordinary uses and purposes of the articles they make; but when called to exercise their calling in the higher realms of their art, they fall short of understanding the aims of and purposes of the inventor, although they can work with a nicety to his plans. This proposition is more truly correct of the common workman than of the one who is called upon to erect the machine, for the latter must be a poor observer if he is capable of placing all the parts of a machine in correct position and yet does not understand their ultimate operation and use.

The work of the inventor is in the domain of speculative thought. The work of the machinist is, on the other hand, of the most practical character. The latter is the complement of the former. What the one conceives in his mind the other materializes in wood and iron. The inventor carries his speculations into new fields. The machinist follows him in his adventures, and at every step stands ready to execute his designs. Without the latter the inventor would be powerless to accomplish his purposes. It is a useless speculation, the determination of which position is the more valuable, that of the inventor or the machinist, because each is necessary to the other.

The more mechanical skill the inventor possesses the better is he equipped for his work. To be able to make a machine as well as devise it is a double acquirement. In fact, it seems essential that the best inventors should possess a certain degree of mechanical skill. The training necessary to obtain it is highly beneficial in showing him the properties of the material of which his machine will be made, and the difficulties in the way of adapting means to ends in bringing it forth.

The inventor not unfrequently meets with trouble in the machine shop, owing to the fact that the true principle of his invention is not grasped by those attempting to execute his orders. The result is that work has to be undone, delays occur, and the cost of construction is greatly enhanced. The fault is sometimes that of the inventor, who has not sufficient knowledge of shop work to give the proper instructions for producing the exact article desired. In such instances it is a cut-and-try experiment until the desired end is reached.

It is evident that the nearer the inventor approaches perfection in mechanical skill, and the nearer the machinist approaches the position of the inventor, the better for both. This can be done. Study and observation and the best use of particular faculties called in play, either in the workshop or in the inventor's laboratory, will accomplish the result desired. —*Scientific American.*

A CEMENT FOR STEAM ENGINES.—According to Grier, an excellent cement for steam engines is made as follows: Take of sal-ammoniac, two ounces, sublimed sulphur, one ounce, and cast iron filings or fine turnings, one pound. Mix them in a mortar, and keep the powder dry. When it is to be used, mix it with 20 times its quantity of clear iron filings or turnings, and grind the whole in a mortar, then wet it with water until it becomes of convenient consistence, when it is to be applied to the joint. After a time it becomes hard and strong as any other part of the metal. Again, in joining the flanges of iron cylinders or pipes, to withstand the action of boiling water and steam, great inconvenience is often felt by the workman for want of a durable cement. The following will be found to answer: Boiled linseed oil, litharge and white lead, mixed up to a proper consistence, and applied to each side of a piece of flannel, linen, sheet lead, or even pasteboard, and then placed between the pieces before they are brought home, as it is called, or joined. For small joints, India-rubber rings are used with success, and for large ones pure flax rope (soft twist and plaited), steeped in melted tallow. This packing to be always kept tightly screwed between the flanges. Another substance in the market for a similar purpose is asbestos cement.

An Important Discovery.

All who are familiar with the manufacture of very thin sheets of metal, either iron or steel, know the great difficulty there is in picking the scale off, in order to get a fine finished surface. They know the danger of the acid penetrating through the metal and destroying it. It is a difficult thing to do well, and the operation is one that must be done carefully, and is one that everybody that has it to do will be glad to get rid of.

At a recent meeting of the Local Engineers' Society at Pittsburg, William Metcalf read a very interesting paper on natural gas, in the course of which he referred to the above fact, and stated that a gentleman at Leechburg, now applying for a patent on the process in annealing fine sheets, brings the annealing-box to the required heat by use of the natural gas, and then, by a pipe connected into the box, when the metal is hot enough, turns in a stream of the natural gas on to the material, and allows it to pass through, keeping the box hot for some little time, and then allowing it to cool gradually, when the whole mass of sheets come out perfectly clean—as clean as tin, but not as bright, but entirely clean; and, singular to say, though the sheets are very thin and packed closely in heavy boxes, this gas in some way gets to all among them, and they come out perfectly clean and free from scale. This is another application of the gas that will certainly be of great benefit if it proves to be practicable, and there is no reason why it should not be.

THE CHEMIST IN IRON WORKS.—"Ten years ago," said the head of a Pittsburgh iron firm, who had been the expert on all of the recently built bridges of any importance in this country, "there were no more than two or three chemists in Pittsburgh. In 1872 Captain Linnt spoke to James Park, Jr., about having a chemist at his steel works, but that gentleman said that it was unnecessary, as experienced steel-makers could tell what was good or bad steel, but it was not three years until he had three chemists employed at fixed salaries. The trade required it. The first chemist here was Chairman Curry, of the Board of Directors of Carnegie Bros. & Co., who was then at the Lucy furnace. Since then almost every steel company has the regular services of chemists, and it is a very poor concern which does not have one."

STEEL.—The fact is familiar to metallurgists that a steel which is very flexible when cold often breaks at the blue annealing temperature. It has also been generally considered that the purer the iron is the less subject it becomes to this defect. It appears, however, that the workmen of the Ural Mountains, who use iron of remarkable purity, have often observed the same fact. It has also been found on investigation that the metal in question becomes powdery at a temperature between 500° and 700° Fahr., or the temperature at which willow twigs take fire. This phenomenon would seem to explain a large number of accidents, as, for example, the breaking of tires under the action of brakes, and the fracture of riveted molds, and of machine arbors, which become heated by friction, hitherto regarded as unaccountable.

TRUING GRINDSTONES.—Several of our exchanges have suggested the use of a piece of gas pipe for truing a grindstone. The *Scientific American* explains how it should be, as follows: Lay a flat iron bar across the grindstone frame as close to the stone as possible without touching. Take a piece of ¾ gas pipe 2 or 3 feet long, and hold it at about 45°, with the end resting upon the iron plate. Roll the pipe slowly across and against the face of the stone, holding the pipe firmly to its place, so that the stone will bite upon the end of the pipe. The pipe will wear away as well as the stone; rolling it will keep the end even.

NEW PROCESS OF STEEL MANUFACTURE.—A syndicate has been formed for experimenting on and controlling the new process of manufacturing steel to compete with the Bessemer process. The expectation is that it will take the place of forged or rolled iron in the manufacture of different articles. The syndicate is composed of several prominent iron manufacturers, each one of whom has paid in $10,000 to form a pool of over $100,000 to use in perfecting the invention. The patentee claims that he can manufacture steel much cheaper than it is done at present.

WRITING AND LETTERING UPON STEEL.—Steel can be written upon or engraved by first cleaning it with oil and then spreading a coating of melted beeswax upon it. The writing can then be done on the beeswax, with any sharp instrument, and the lines and marks thus made should be painted with a fine brush dipped in a liquid made of one ounce of nitric acid and one-sixth of an ounce of muriatic acid. When the written lines are filled with this liquid, it should be allowed to remain five minutes, and then the article should be dipped in water and afterward cleaned.

SCIENTIFIC PROGRESS.

Firefly Light.

MM. Aubert and R. Dubois have recently made a number of interesting observations on the light emitted by "pyrophores," or fire bearing insects. These pyrophores have three luminous organs, one situated at the ventral part, and two at the superior part of the prothorax. The last are always visible, and were submitted to the tests. The light was produced by rubbing the insect with a light brush, and was examined by means of an ordinary spectroscope with a prism of very refrangible glass and a micrometer. The spectrum was very fine, continuous, and showing neither brilliant nor dark rays. This peculiarity has already been pointed out by Pasteur and Gernez, who studied the light from a pyrophore belonging to the late editor of *Les Mondes*. The spectrum occupied about 75 divisions of the micrometer, and extended on the red side to the middle of the interval which separates the rays A and B of the solar spectrum, and on the blue side a little beyond the ray E. When the intensity of the light varied, its composition changed in a remarkable manner. When the brightness diminished the red and orange disappeared entirely, and the spectrum consisted of green, and a little blue and yellow. The green rays lasted longest. The contrary took place when the light grew in brightness, the green appearing first and the spectrum extending a little on the blue and a great deal on the red side. The least refrangible rays are therefore emitted last.

No other luminous source known appears to behave in like manner. The only case which bears a resemblance is that of sulphate of strontium becoming phosphorescent under the action of light at a growing temperature. As the temperature rises, rays less and less refrangible appear in the spectrum, but at the same time, the less refrangible rays disappear. When the light of the organ begins to appear, the central and forward part only of the organ is luminous. It is only when the light is very bright that the periphery of the organ is luminous, and then the red rays are visible. The light was found to give photographic images on a gelatino-bromide plate; the insect being two centimeters from the plate, and the time of exposure reduced from an hour to five minutes. The photographs show that the light of the pyrophore is capable of producing intense chemical effects, if the smallness of the quantity emitted be taken into account. The light also determines the phosphorescence of sulphate of calcium, after an exposure of five minutes; and cosine and szotate of uranium are rendered fluorescent by it.

Automatic Arctic Exploration.

The Chicago *Current* says: Probably the most wonderful thing in connection with the whole sad history of Arctic exploration is the recent discovery of an ice floe in the waters of Davis' strait—west of Greenland—which had drifted from a point in the Arctic ocean northeast of the Lena delta—where the crew of the Jeanette divided into three parties and took to the open waters—to the southernmost point of Greenland, and north again to Baffin's bay. Upon this floe were a corpse and many indubitable relics of the expedition, including an article of wearing apparel marked with the name of Seaman Noros, who, it will be remembered, in company with Seaman Nindermann went a few miles ahead of poor De Long, and lived to write the most extraordinary experience ever penned by a human hand. Had these two simple seamen been able to tell, in the Siberian tongue, that their comrades were only 11 miles back, the whole De Long party would have lived to join M[illegible] and Danenhower.

The floe discovered by the Greenlanders possibly crossed directly over the North Pole. From the Jeannette floe to the southern point of Greenland, in a direct line across the Pole, is 3,500 miles, but by way of the northern shore of Asia and Europe—past Cape Northeast, Nova Zembla, Spitzbergen and Iceland and north again into Baffin's bay—would be a distance of at least 6,000 miles. Scientifically, the life of a moving ice floe for so many years, and its migration from one side of the world to the other, ought to furnish suggestions and data more valuable than all the other fruits of polar research combined. Self-registering meteorological apparatus, and possible gauges of the miles traveled may, in the future, reveal to the investigators what the sacrifice of thousands of lives have otherwise failed to discover.

A THEORY AS TO THE ORIGIN OF THE DIAMOND.—Mr. W. H. Huddleston has recently advanced an extraordinary theory to account for the origin of the diamonds of South Africa. As is well known, the diamonds occur in a sort of soft, earth breccia, made up of fragments of many kinds of rock and evidently of comparatively recent origin. A great part of the pebbles consist of basalt and other igneous rocks. Pieces of coally matter and fossil shells also occur in the diamantiferous breccia, the matrix of which is a soft hydrated silicate. Dykes of volcanic rocks form the walls of the diamond-bearing formation. The author maintains that it is certain that the whole matrix flowed upward, and that it is impossible to doubt the eruptive character of the diamond rock. He thinks that super-heated steam was the eruptive agent and suggests the analogy of mud volcanoes. Since no diamonds have been found except in this soft breccia, he suggests that they were formed in the breccia itself at a considerable depth and then carried upward. The carbon is supposed to have been driven from certain carbonaceous shales, which were distilled under enormous pressure, when the carbon had no choice but to assume the crystalline form. Unfortunately this latest theory cannot be applied to any other diamond field.

The Type Writer in Telegraphy.

At the International Electrical Exhibition in Philadelphia, we saw an operator, says the editor of the *Electrical World*, Mr. James W. Sullivan receiving from a Morse sounder, at a fair rate of speed, and copying the messages in beautiful style on a type-writing machine. The sounds from the Remington and the sounder did not appear to interfere with each other, and the operator seemed to receive with much more ease than with pen or pencil, while the copy was as clean, neat and plain, as though it came from the printing press. Mr. Sullivan pointed out a boy in the department, in which he was working, who, though not a telegraph operator, could print 75 words a minute in fine style from dictation.

The thought occurred to us that any company which desired to make the best use of its wires, and at the same time earn a reputation for neatness and speed, might do so in this way. We can point out an old, almost forgotten system of sound telegraphy (Morse code), by which very near or quite 75 words per minute can be transmitted over a single wire. An expert sound reader might thus, with a type-writer, turn out messages in excellent shape—in fact, in the clearest and cleanest of print—at double the speed now usually attained. One of these considerations alone would prove a great boon to that portion of the general public, not apt in deciphering the hieroglyphics now frequently turned out as "messages."

The combined telegraph operator, stenographer and type-writer is, we think, one of the bright rifts in the dark clouds of operatorial life. The rapidity with which the type-writer is now superseding all other forms of copying is not less remarkable than the increasing dexterity of its manipulators; and the proposition stands, that if the speed of a Morse circuit can be raised to match the speed of a first-class "writer" (say, to send and receive 75 words easily per minute), the service will have been improved.

New Alcoholic Ferment.

At Busalla, in the north of Italy, there is a small brewery which has gained a considerable reputation for its beers brewed on the low fermentation system. Last season these beers were very inferior, and without any apparent reason. A local chemist, M. Mendes, was called in to investigate the matter, and the result of his researches was the discovery of what is believed to be a new form of ferment. Among the cells of ordinary Saccharomyces cerevisiæ were some of Saccharomyces Pastorianus, and some other cells very much smaller in size. These latter were isolated and cultivated by themselves, and were then found to be almost spherical in shape, and from 1-300 to 1-500 of a millimeter in diameter. The shape, size and general appearance of the cells of this ferment were found to be very constant, and they very closely resembled those represented on the right hand of the plate iii in Pasteur's "Etudes de la Biere."

So far there would be nothing very remarkable in the identification of a new form of ferment, but M. Mendes by some carefully conducted experiments has proved that this ferment is altogether without action on cane sugar. It is generally admitted that ordinary yeast is not capable of directly fermenting cane sugar, but that it first exerts an inversive action on cane sugar, and after this inversion fermentation takes place. Now the peculiarity of the new ferment discovered by M. Mendes is not that it will not ferment cane sugar, *but that it will not invert it.* Experiments were made with this new ferment on impure cane sugar solutions, and the result was said to be that the glucose and invert sugar were fermented by it, but the cane sugar was left untouched. The practical importance of this discovery to sugar refiners must therefore be very great, and it is at the same time of very considerable interest to brewers.—*Scientific American.*

ELECTRICAL HYPOTHESIS OF FLAME.—Large furnaces must apparently replace small ones. Mr. F. Siemens has proved that solid substances interfere with the formation of flame, and that flame injures solid substances with which it comes in contact. To account for the phenomena he advances, preferably, an electrical hypothesis. Accordingly, he explains flame as the result of an infinite number of exceedingly minute electrical flashes, the flashes being due to the very swift motion of gaseous particles, and a solid body which opposes itself to these flashes is cut by them, while, the motion being more or less arrested by the solid body, the flame is damped. Mr. Siemens insists, therefore, that flame must not be allowed to impinge upon bodies to be heated, but must simply heat the bodies by radiation, and furnaces must be so constructed as to allow the flame to develop out of contact not only with the substance on its bed, but with the walls and roof of the furnace itself.

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Passing Events.

For the past two weeks miners everywhere have been engaged in doing assessment work on old claims or development work on newly-located ones. A great deal of mining ground has changed hands under the operation of the laws. As is usually the case, the work being done will no doubt prove many of the locations to be worth working steadily.

The Legislature is in session at Sacramento, but very little business has so far been done. The deadlock in the Senate and its failure to organize has delayed matters greatly.

All over the coast there is now a summing up of the results of last year's work in the mines. In our next issue we shall give a very elaborate review of the mining field on this coast, with statistics of production of the different camps.

There are signs of a general revival of gold mining all over the country, a matter of great interest to California, which has more extensive gold fields than all other States and Territories combined.

AN important discovery of rice silver ore has just been made made about five miles from the Oro Grande mill, on the Mojave river. The discovery was made by Messrs. H. A. Newman, Ralph Shelton and A. M. Hathaway, all of Santa Ana. The ore is a smelting ore as far down as the shaft has been sunk, about 60 feet, and contains an abundance of native silver and the richest of bromides.

Cable Railway Curves.

An important patent suit has been on trial in the U. S. Circuit Court, which has been of great interest to the cable railway companies. It was the case of Aiken Haman *vs.* the Sutter St. Cable Railway Co. This suit was brought for alleged infringement of a patent granted to Aiken Haman for improvements in cable railways, dated October 3, 1883, No. 287,377.

The particular features of this patent which are claimed to have been infringed, are the bracket piece on the lower part of the grip carrying a guide roller and a curved bar or rail within the tube, against which this guide roller acts in passing round a curve so as to prevent the grip from coming in contact with the horizontal pulleys which guide the cable and also to relieve that portion of the grip shank which passes into the tube through the slot from undue strain, laterally, when going round a curve.

In the Sutter street road where it passes from Polk to Post and from Post to Larkin streets there are curves to pass and a guide rail is placed in the tube above the horizontal pulleys, and against this the lower part of the grip slides; a wearing piece being fastened to the grip, and a roller not not being used to relieve the friction of the surfaces; the wearing piece and the guide rail being occasionally lubricated with a heavy oil.

The defense relied upon the patent granted to A. E. Hovey, 176,136, April 18, 1876. Patent to Charles M. Chuse, No. 235,127, Dec. 7, 1880, and English patent No. 5107 of 1879, granted to A. S. Hallidie, as anticipating the patent to Haman which was dated Oct. 3, 1883.

In his charge to the jury on Saturday last, Judge Sawyer said that no evidence had been presented beyond these three patents, which would show that this invention of Haman's had ever before been used, so that it would not be necessary for the jury to consider any evidence outside of these three patents, as to the plaintiff being anticipated. The dates of these patents being established and testimony given as to their identity with that of plaintiff, it belonged to the jury to decide the facts. Should this be decided in favor of defendant, or that these patents were the same or covered the claims of plaintiff's patent, then the evidence of plaintiff to establish priority of invention on his part should be considered. This evidence was to the effect that Haman had perfected his invention before the date of either of the three patents mentioned had been granted. Evidence had been introduced by defendant to show that plaintiff had seen and examined models of grips and tubes before he made claim to this invention, and that the idea was not his own. That in his proceedings in the Patent Office his specifications had been examined—his claims several times rejected—amended, and that at last he had inserted the claims which had been allowed. But that these claims which had been allowed, and upon which suit has been brought, was not the invention upon which the application had been based, and that also they were of a later date than those of the patents which had been introduced by defendant as anticipating the plaintiff's claims.

If the jury were satisfied that the plaintiff had, before the date of the opposing patent exercised invention, and had perfected his invention, and had not used mere mechanical skill or judgment, although he may have seen the model and patents above alluded to, then they should find for plaintiff. That is, if in the plaintiff's patent he had produced such a device, or combination of devices, as would not have been done through mere mechanical skill by one who had seen the other patents, then they should find for plaintiff. Should the findings be for plaintiff, then the question of damages would be determined, and that amount would be the value of plaintiff's improvement over any other which was available and known to defendant, and could have been used by them instead of that of plaintiff.

No decision was reached, for the jury, after having been out about 24 hours, failed to agree, and were discharged.

FROM a report of the sub-treasurer, it appears that there is $1,217,500 more gold coin in California than there was a year ago. This statement, of course, assumes that what has been carried out of the State by private hands has been offset by receipts in the same way.

Our California Northwest.

The Original Gold Bluff—Hydraulic Mining on the Klamath—Primitive Methods and an Independent People.

A good deal having been published of late relative to the mines and mining matters in the northwestern part of California, much public interest has been awakened on that subject. From a party long resident in and recently arrived from that section of the State, we gather the following information in regard to its mineral resources and what seem to be the condition and prospects of the mining industry there at present. Washing the auriferous sands on the beach at

The Original Gold Bluff

Appears to be still carried on there, being practiced after the manner first introduced in 1851, when this notable locality was discovered, and steadily pursued ever since. The beach here, or at least the more prolific portion of it, is owned by two parties in about equal proportion, the southern half belonging to Greenbaum & Co., of San Francisco, and the northern to Edson Adams, the well-known Oakland capitalist. These parties keep each a small company of men on the ground, who, at the occurrence of the first low tide after a storm, the wind being in the right direction, hurry a train of pack animals down to low-water mark, and gathering with all possible expedition the rich streak of sand thrown up by the surf, pack it to higher ground, where it is afterwards washed in sluices. Although the product of gold here could, by adding to the working force, be correspondingly increased, the owners of these properties have been so well satisfied with their earnings that they have not sought to enlarge them by recourse to the simple process here suggested. So far as the northerly half of the beach is concerned, the present owner bought it as a permanent investment, and, being content with the large interest the purchase money returns, does not care to exhaust the deposits by any more rapid method of working. That the investment is a good one may be inferred from the fact that the owner has been repeatedly offered $350,000 for the property, the price he paid for it six years ago being $35,000.

Not only does the beach here pay well for working in the manner described, but the bluff that overlooks it being also rich in gold, could be profitably washed by the hydraulic process. But the two companies named, who own it, also have never done more than wash enough of the gravel to prove its great value, the bulk of it prospecting at the rate of 50 cents per cubic yard. A ditch for bringing water on this bluff would, as compared with those over on the Klamath, be rather long, the nearest source of large water supply being 30 miles distant. But as the cost of such a ditch would not be large, and the bluff, being composed mostly of sand, could be easily run off, there is little doubt but hydraulic operations will some day be inaugurated and successfully carried on here.

Leaving this historic landmark and proceeding easterly, a day's travel brings us to

The Klamath River,

Along which placer mining is still being actively pursued, this being one of the few streams in the State that continues to pay more than average wages. While other branches of the business are carried on here, most of the gold produced is taken out by the hydraulic style of washing, which, however, is, as a general thing, conducted in a very inefficient way and after the most primitive methods. The section of the river which constitutes the principal site of this class of operations, beginning a little below Orleans Bar, extends up stream for a distance of 70 miles or more. Along this stretch high banks and low bars of rich gravel occurring at short intervals flank the river on either hand, the tall and heavily timbered mountains standing directly over them. Down the sides of these mountains flow innumerable streams of water, many of them of large size and nearly all perennial.

Backward in Everything.

While there are a great many different companies at work here, there is not along these 70 miles of the river a dozen No. 2 giants to be seen. Nearly all are, in fact, No. 1, the smallest size. The sluices are everywhere short, while undercurrents are hardly known and quicksilver is in many cases wholly dispensed with. To the miner accustomed to the powerful apparatus and the effective gold-saving appliances in use in the more central hydraulic districts a statement like the above would seem incredible. Yet so it is; these Klamath miners, as regards improvements, are fully 20 years behind the age. Not that they are ignorant of these improvements, for they know all about them; but, being able to make good wages employing their imperfect implements, and adhering to their old ways, they prefer not to bother themselves about anything better. The indisposition of these dwellers on the Klamath to encourage innovations of any kind is well illustrated by the manner in which they suffer goods to be still packed in from Humboldt Bay and other distant points on the backs of animals, though wagon roads could easily be constructed over these routes.

A Look at Things as They Are.

To show that we do these northern people no injustice, let us, starting near the lower end of the hydraulic range, take a run up the Klamath and see what a few of the more representative companies are doing, and what sort of plant they make use of. There are a great many small companies at work along the river below Orleans Bar; but, commencing at that point, we have what is known as the Brown claim, located on the second bench half a mile back from the river, the old Orleans Bar being between them, but lying too low to be worked by the hydraulic process. The Brown claim employs four men, runs a No. 2, giant an average of three and a half months in the year, and yields between $5000 and $6000 per season. This production sufficing to pay hired labor and maintain the owner for the balance of the year, there exists, of course, no necessity for seeking to increase it, though a few thousand dollars expended in bringing on more water and providing better apparatus would enlarge the revenues by three or four hundred per cent.

Passing the claims of the Wilder Brothers, situated on opposite sides of the river a little above Orleans Bar, and both paying well, we come to the Perch ground, where, by reason of better water supply, the working season reaches what is here the extraordinary length of four and a half months. This claim, like the two last mentioned, makes use of only one small giant, though the stock of gravel in all of them and the water within easy reach, would, if availed of, give employment to two large sized giants on each. Proceeding up stream by the claims of Markison & Co. and Halverson & Co., both German, and by half a dozen other mines, the whole of them running No. 1 or 2 giants, whereas they ought to be running No. 6 or 8, we reach

The Old Rood Property,

One of the best on the river, and now owned by Allen Heald, who having had his schooling in the live districts further south, has planned and is about to make such improvements as will increase the past product of the mine many fold, raising it from $1000 per month to $8000 or $9000 at least. This ground worked in a limited way has made a fine record. The patented claim covers an area of 65 acres besides 160 acres secured by location. Nearly the whole of this land consists of rich gravel ranging from 10 to 100 feet in depth. What is required here is a new ditch, not over two miles long and improved washing apparatus. These supplied and the property will be capable of making net monthly earnings varying from $4000 to $5000 for nine months in the year.

Skipping again many small claims, we strike Cottage Grove, for many years a prosperous camp, though its resources have never been more than partially developed. Passing on, we come to Bunker Hill, another thrifty hydraulic locality, the principal claim here having once been owned and successfully operated by William Raymond—he of Raymond & Ely fame. Two giants are now being run on this property, and Temple, the owner, seems to be making money. Seven hundred inches of water are brought in here through a ditch five miles long—a rather long ditch for that region of country.

Taking now a long stride, passing the Wingate ground, with a two-mile ditch and one small giant, and several others equipped in much the same way, we come to the

Happy Camp Hydraulic Property,

Formerly owned by Horace Gasquet, who not long since sold it for a large sum to a New

York Company. The ground, which is rich, extensive and well fitted up, is supplied with 2,000 inches of water brought in from Indian creek through an 18-mile ditch, the longest on the Klamath, if not in Siskiyou county. This ground has always netted the owners large profits. In the early day it also was owned by Raymond who cleaned up out of this and the Bunker Hill ground over $100,000—but he was not a man of the Rip Van Winkle stripe.

Two miles above the Happy Camp claim is situated

The Del Norte Mine,

Owned and managed by S. S. Richardson, who during the past 15 years has taken from it about $500,000; this being over and above the considerable sums purloined by the Chinamen, who for several years past have been working it on shares. Here is another of the long ditches of this country, the water being brought a distance of ten miles. There is ground enough here to last for 50 years, yielding a gross product of $65 000 per annum.

Between Richardson's place and the mouth of Scott river, 30 miles further up, a number of claims are being worked, the most of them in a small way, and after the inefficient manner so characteristic of mining on the Klamath, which in the light of modern inventions and California progress is really an institution of the Dark Ages.

From the foregoing it will be seen that there exists here along this great river of the Northwest

A Most Eligible Field for Hydraulic Mining,

The gravel deposits being not only rich and extensive, but well situated for cheap and effective working. They are free, it is said, from any superincumbent volcanic or other barren matter, except a stratum of loose soil; contain but little pipe clay, and no indurated cement, though the underlying channels abound with huge boulders, indicating them to have been swept, at some former time, by large and swift flowing rivers. The most of the gravel banks are sufficiently elevated above the Klamath, to afford ample outlet; nor can the tailings, after being discharged into that stream, ever accumulate below the dump to a troublesome extent, as the strong and rapid current, during the stages of high water carries them clean away. But while this is the case, these slums cause no annoyance or injury to any interest or property below. The debris question can never come up here, for the reason, that there are no farming lands further down along the Klamath to be damaged by this waste material, nor are there any navigable waters, bars or harbors, to be shoaled by it. Short and inexpensive ditches serve to bring the water, everywhere abundant, and deliver it on the mines. Properties, water franchises included, are cheap, the working season is long, it being possible to run here, where the water holds out, the entire year through. The gravel washed here, is said to yield three times as much as in the more central counties, the net profits realized after ground is opened and outfitted, varying from 40 to 60 per cent of gross production made. In short, the conditions for the prosecution of hydraulic mining, would on the Klamath seem to be of the most favorable kind, and, while we do not say that failures, through ill advised investments or injudicious management, might not occur in this region, we think it may safely be referred to as one worthy the attention of capitalists and others disposed to invest money in the business of gold mining. Of course no one is going to embark his means, either here or elsewhere, without having first carefully examined the field, and we know of none more inviting, to which the trained miner or expert can be sent, than this.

RECENT discoveries of mineral wealth show that the section of the country between Los Angeles and the Colorado river has not been thoroughly prospected. In fact, it is evident that Idaho, Arizona and Nevada have been more carefully prospected for minerals than the great mineral regions in Southern California, within 50 or 100 miles of Los Angeles. The development of the mineral wealth of Southern California has but just begun.

The San Francisco Stock and Exchange Board is in good financial condition, notwithstanding the depression in the mining stock business. It owes nothing, and is more or less directly the sole beneficiary of property worth $425,000, at a low estimate.

The Discovery of Gold in California.

Two days after the date of this number of the MINING AND SCIENTIFIC PRESS occurs the anniversary of the discovery of gold in California. It was on January 19, 1848, that James W. Marshall found the gold in the tail-race of Sutter's mill, that turned the attention of the civilized world to the gold fields of California.

It is fitting that on this anniversary of an occasion which was the foundation of the mining industry of the Pacific Coast—for the development of other regions was the direct result of the working of the California mines some mention should be made of the circumstances of the "find," of the discoverer and of the locality. Through the courtesy of the Sacramento *Bee* we are enabled to give portraits of James

JAMES W. MARSHALL,
The Discoverer of Gold.

GEN. JOHN A. SUTTER.

SUTTER'S FORT, SACRAMENTO, 1847.

SUTTER'S FORT, SACRAMENTO, 1884.

[FROM THE SACRAMENTO "BEE."]

W. Marshall, the discoverer of gold, and General John A. Sutter, who owned the famous mill; also representations of the old fort as it appeared in 1847, and as it looks now. On next page is a good view of the historic mill itself the drawing of which was made by Charles Nahl, in early days. Mr. Marshall was born in Hope Township, Hunterdon county, New Jersey, in 1812. His trade in early life was that of a coach and wagon builder. After living in Indiana, Illinois and Kansas, he came to California, arriving at Cache creek, 40 miles from where Sacramento now stands, in June, 1845. He shortly after went to work for General Sutter at Sutter's fort. He joined the volunteers in the famous Bear Flag war, and after the discharge, returned to Sutter's Fort. Finally he and Sutter decided to go into the lumbering business as partners, and located their saw-mill at Coloma, El Dorado county, beginning the building of the mill in August, 1847.

It was on January 19, 1848, while superintending the building of the mill race that he found the gold. After shutting off the water at the head of the race, he walked down the ditch to see what sand and gravel had been removed during the previous night. He strolled to the lower end of the race and stood looking down at the mass of debris. At this juncture his eye caught sight of something that lay lodged in a crevice on a riffle of soft granite. He stooped and picked up the substance. It was heavy, of a peculiar color, and different from anything he had seen in the stream before. He reflected as to what kind of mineral the specimen could be, and finally concluded that it was either mica, sulphurets of copper —or gold! It was too heavy for mica, was not brittle, as are sulphurets; and, remembering that gold is malleable, he placed the nugget on a flat stone and began striking it with another. The substance did not crack or flake off, but simply flattened under the blows, and Marshall was satisfied that he had indeed made an important discovery.

In a few days he collected several ounces and took them to Sutter's Fort, where it was finally decided that the metal was gold. The news spread and it was not long until the famous "California gold excitement," so big with results to the whole world, began.

In some records the date of discovery is given as January 18th, but the writer, in an interview with Mr. Marshall a few months since, was assured by him that the 19th was the correct date. Marshall is now a poor man, and has been represented as having been persecuted rather than otherwise, which, however, has not been the case. He has really been a privileged character wherever he has been. He lived at Coloma until about ten years ago, and then disposed of his vineyard and went to Kelsey's diggings, where he lived in a cabin five or six years. Since then he has lived in San Francisco, Sacramento, Amador county, etc., having no fixed abiding place. The portrait which is here given is an excellent one of Mr. Marshall, who may be considered one of California's principal historical personages.

General John A. Sutter, who died in Washington, D. C., June 18, 1880, was born March 1, 1803, in the Grand Duchy of Baden. He came to the United States in July, 1834, and settled in Missouri. In April, 1838, he joined a trapping expedition to the Rocky mountains, and came to Fort Vancouver, on the Columbia river. Thence he went to the Sandwich Islands, staying there for five months, when he shipped as supercargo on a vessel bound to Sitka, Alaska. Gales drove the vessel into San Francisco bay in distress, and on July 2, 1839, the craft anchored off Yerba Buena, the site of San Francisco. The vessel had to go immediately to Monterey, the port of entry. Receiving permission to settle in California, he came to San Francisco, and spent some days in finding the mouth of the Sacramento. After some exploration of the rivers, he settled on the spot where the fort was afterwards built. He devoted himself to agriculture and became wealthy. He was declared a Mexican citizen and given a grant of land under the name of New Helvetia, and soon after built Sutter's fort.

On the discovery of gold his workmen all deserted, and it was not long before he was a poor man. He endeavored to obtain redress from Congress for depredations committed on his lands and stocks, but was not successful. General Sutter was a generous man. His manners were polished, and the impression he made on every one was favorable. In figure he was of medium hight, rather stout, but well made. His head was round, features regular, with smiling and agreeable expression, while his complexion was healthy and roseate. He wore his hair cut close, and his moustache short, *a la militaire*. He dressed very neatly in frock coat, pantaloons and cap of blue.

The old fort which bore Sutter's name was built in 1849. The ruins are yet to be seen near L street, between Twenty-seventh and Twenty-eighth streets, Sacramento City. The structure was a parallelogram in form, about 500 feet in length and 150 in breadth, with two bastions. In the middle of the square was a building two stories in hight and containing four rooms. The walls about the enclosure were ten feet high, having a turret with embrasures and loop holes for firearms. Against the walls on the side were built the storerooms of the establishment, blacksmith shop, granaries, etc. At the principal gateway was at all times stationed an armed sentinel.

Academy of Sciences.

At the annual meeting of the California Academy of Sciences, on recommendation of the Council, E. F. Lorquin and Mrs. Mary K. Curran were elected honorary life members, for services rendered to the academy. Prof. Pier-Andreas Sarcardo, of Padua, Italy, was elected an honorary member; and J. H. Smythe a resident member.

The secretary reported that during the past year 21 new members had joined, and two resigned. There are now 127 life members, and 183 resident, a total of 310 members. He also reported that another bulletin is now in press, and other material is being prepared for publication.

The treasurer reported the receipts for the year as $8,678.44, and disbursements $8,210.35; balance on hand, $468.09.

The librarian reported that 860 books had been added to the library during the year.

The corresponding secretary called attention in his report to the necessity of increasing the facilities for exchanges.

The curator of the herbarium presented a report of the department under his charge, which is now in good condition, many new species having lately been added.

The Director of the museum gave a summary of the work done in the different departments of the museum during the year.

The Board of Directors presented a full report of the business affairs of the Academy for the year.

At the annual election, the following officers were elected to serve during the ensuing year:

President, George Davidson; 1st vice-president, H. W. Harkness; 2d vice-president, H. Herman Behr; cor. secretary, Samuel B. Christy; recording secretary, Chas. G. Yale; treasurer, Elisha Brooks; librarian, Charles Troyer; director of museum, W. G. W. Harford. Board of trustees—George E. Gray, Thomas P. Madden, Ralph C. Harrison, James M. McDonald, Louis Gerstle, C. F. Crocker, R. W. Simpson.

THE suit of Carl Schruintzer et al vs. Wangenheim, Sternheim & Co., has been filed in the United States Circuit Court. The suit is brought to recover $500 for an alleged infringement on a patent for the mitrailleuse lamp-burners.

Electric Lighting of Mines.

A correspondent of the London *Mining Journal* says: The annual output of coal in the British Islands may be taken roundly at 170,000,000 tons, which distributed becomes the great sources of heat, light and power, and an increment that cannot be estimated in the sum of human happiness. At the beginning of the present century a large proportion of the coal required was worked from pits near the outcrop, the mining of which was easy and beset with fewer dangers than surround the production of the vast quantity that is demanded by the markets of to-day. A great change has come over the miners' art, pits are sunk to depths of from 2,000 to 3,000 feet, in consequent of which the working collier is exposed to dangers in some respects unknown in the past. One notable point of difference arises from the fact that at least three-fourths of the quantity of coal now raised must of necessity be worked by the aid of safety-lamps. It is not a little curious to reflect than the propulsion of our huge ships the rapid locomotive, and the thousand and one mechanical wonders that meet our gaze on every side depend for the foot pounds generated on the invention of Sir Humphrey Davy, and that without his lamp the treasures of the earth were sealed and beyond our reach.

The Davy lamp at present (with some modifications) is the ordinary means of giving light to the coal miner, for whether we examine the invention of Stephenson, Clanny, or the many busy brains that have been engaged in perfecting the beautiful discovery of Davy, it must be acknowledged that the cylindrical wire gauze surrounding an ordinary oil lamp flame remains the safety-lamp of to-day. For many years after the introduction of the Davy it was considered by the working miner that he possessed a means of insuring absolute safety from explosion; indeed, many of the most prominent mine managers shared in the delusion. This feeling of security that had taken hold of the mining world was somewhat rudely dispelled some 20 years ago by an explosion that took place in one of the best managed and ventilated collieries in the North of England. At the official inquiry into the probable cause of the accident one of the witnesses gave it as his opinion that the explosion arose from the ventilating current becoming overcharged with inflammable gas, owing to the accidental holing into some old workings, and that the velocity of the current had caused the explosion within the lamp to pass through the meshes of the gauze, and so explode the external mixture. This opinion was not shared by the other scientific witnesses, but it led indirectly to a series of experiments, which conclusively proved that every description of lamp in use in the district exploded when exposed to velocities that did not exceed the current in question.

It need scarcely be added that the result of these experiments, which were elaborate and carried out with every attention to scientific detail, had the immediate effect of inducing many of the most promising mining engineers of the day to devote an amount of attention to the subject that was probably without parallel from the time when the old flint mill was displaced by the invention of Davy and Stephenson. All the experiments and improvements were made upon the existing types, and it ought not to be a matter of surprise that nothing original or strikingly novel was the outcome. The first departure from the old style of lamp was made by two French engineers, who constructed an electric lamp, the light of which was enclosed in a glass tube. This was the subject of many experiments in the county of Durham; and, although the illuminating power was equal to the lamps in use, yet the surface exposed by the tubes and the size of the detatched battery were considered insuperable objections to its introduction into general use. Since this invention was tried in England, every advance has been on the old lines; and, although much has been accomplished, yet the method of lighting our collieries cannot be considered satisfactory. If, however, we turn our attention to what is being accomplished by our lively and versatile Gallic neighbors, we find that, by continual and untiring experiments, that an electric lamp has been invented that bids fair not only to revolutionize the existing system of lighting mines, but is so simple in construction and so easily manipulated, that it is likely to supersede the existing type of railway lamp, and will prove invaluable for use on shipboard, as well as an elegant and brilliant mode of lighting our households.

As a mining lamp it seems to fulfill all the conditions requisite for yielding a bright and powerful light with perfect safety. In weight it is about that of an ordinary Clanny, it contains its own battery, it gives off the light of several oil lamps, is simple in construction, portable, economical, costing about a farthing an hour, is quite safe in all mixtures of gas and air, gives off no sparks, the light being incandescent, and consequently in vacuo it requires no more skill in management than a Stephenson; the intensity of its light is easily regulated, and its cost about that of the common Clanny. We shall hail with pleasure the introduction of this lamp into the mines of Great Britain, feeling assured that the increase of light and safety will guarantee its speedy adoption.

A New Dam.

In the last number of the PRESS, in the "Mining Summary" under the the head of Fresno county, was given a short item relative to the new ditch of the Quartz Mountain mining company. The following is a description of the new dam for controlling the water from which the ditch is supplied:

The dam on the north side of the San Joaquin at the foot of Crane valley is a massive and substantial structure, built of logs and stone. The river at the point selected for the dam is walled in by abrupt granite bluffs on either side, the bed of the stream measures 60 feet, the banks or bluffs receding at an angle of about 30 degrees, and the bottom being solid granite. The first timber placed in position is laid crosswise the river, is 80 feet in length and an average diameter of 20 inches, a recess in the rock in both banks being blasted out for the ends of the timber to rest in, and the log fitted closely to the bottom and bolted to the solid rock with iron bolts one and a half inches in diameter. On this log at intervals of 10 feet, are placed logs of similar size, 20 feet long, with the large end fitted and bolted to the foundation log, the smaller end projecting up stream at right angles and likewise being bolted to the bed of the stream. Three similar logs are placed across the stream, being fitted to and resting on the 20-logs, leaving spaces of 10 feet between, thus forming the bottom of the first two tiers of cribbing, the logs being bolted solidly together at each intersection or crossing throughout the dam, the length of the logs and their number increasing as each tier was put in place, until the structure was 18 feet high at the face, 42 feet up stream from the face and having a width across the stream at the top of the dam of 110 feet. In its construction 260 large pine trees were used and over three tons of one and a half inch iron bolts, half a ton of spike nails and 40,000 feet of lumber, A wasteway is provided near the bottom four feet square, lined with heavy planking, which is secured by safety waste-gates so that the entire head of water may be drawn off at pleasure. The cribs are all filled with broken stone and earth thoroughly packed in. The surface of the dam is being covered with heavy planking securely spiked down. This dam is one of the most substantial structures of the kind on this coast and will endure for generations to come.

The company has a saw-mill within a few hundred feet of the dam, which is now cutting lumber for the necessary fluming on the line of the ditch. The mill will be kept running through the winter when it will be possible to do so; but, in view of the fact that the season of our winter storms has arrived, and they are liable at any time to stop the production of lumber, and in view of the further fact that it would entail a heavy expense to construct the fluming during the winter months, with all the attendant difficulties of getting in necessary supplies and material, the management reached the conclusion that it would be a matter of economy to defer this work until spring. In pursuance of this conclusion it was further decided to place all the company's work on a winter footing, only enough employes being retained to keep everything in proper shape until work shall be resumed upon the opening of spring.

SUTTER'S MILL, WHERE GOLD WAS FIRST DISCOVERED IN CALIFORNIA BY JAMES W. MARSHALL.

CALIFORNIA COAL.—The Lancha Plana coal mine, owned by Messrs. Murray & Waddell, and which has been idle for some time on account of the owners not having sufficient means to work it to advantage, has recently been leased for a period of 20 years to a Mr. Gregory, of Sacramento. The coal found at this point is said to be of a better quality than the Ione coal. The new proprietors have started in to work the property on a large scale. The mine is five miles distant from the terminus of the San Joaquin and Sierra Nevada narrow gauge railroad. At present the coal is hauled by team to the railroad depot at a cost of $2 per ton. By the cars it is hauled to tide-water and from thence shipped to San Francisco and other points. The first shipment was made two weeks ago. It can be laid down in San Francisco for $6 per ton, which will leave the mine owners a fair margin of profit. It is the intention of the new management to build a railroad side track to the coal mine, which will greatly reduce the cost of transportation to market.—*Amador Ledger.*

ENGINEERING NOTES.

Engineering and Science.

The term engineering is coming to have a broader and broader meaning. Even in the careless popular mind it covers much more ground than it did a few years since. In its highest and widest scope, practical engineering now brings all of the other sciences into play. It is engineering skill and genius which provides the mechanical facilities for applying scientific discoveries to every-day uses, and thus give them commercial values. All the other sciences are, therefore, the handmaidens of engineering science, and the genuine engineer is, in one sense, a great tactician who directs, manages and makes the other sciences serviceable. He is the planner and they are the instrumentalities.

The relations of science and engineering are dwelt upon by an article in *Nature*, which furnishes some striking illustrations of this thought.

Some thirty years since Mr. Bessemer conceived the idea that the injurious constituents of raw iron, such as silicon, sulphur, etc., might be got rid of by simple oxidation. The mass of crude metal was heated to a very high temperature, atmospheric air was forced through it at considerable pressure, and the oxygen, uniting with these metaloids, carried them off in the form of acid gases, which, on account of the heat, were in a very luminous condition. But the important point was to know where to stop—how to seize the exact moment when all, or practically all, hurtful ingredients had been removed before the oxygen had turned from them to attack the iron itself. It was suggested that each of these gases, in its incandescent state, would show its own peculiar spectrum; and that if the flame rushing out of the throat of the converter were viewed through a spectroscope, the moment when any substance, such as sulphur, had disappeared would be known by the disappearance of the corresponding lines in the spectrum. This anticipation was verified, and the spectroscope, though now superseded, long had its place among the regular appliances necessary for the carrying on of the Bessemer process.

Indeed, this process was almost completely worked out in the laboratory before being submitted to actual practice.

The basic process is the latest development, in this direction, of science, as applied to metallurgy. Here, by simply giving a different chemical construction to the clay lining of the converter, it is found possible to eliminate phosphorus—an element which successfully withstood the attack of the Bessemer system.

Again, there are few mechanical principles more widely known than that of the so-called centrifugal force. The effect of this force is that anybody revolving in a circle has a continual tendency to fly off at a tangent, the amount of this tendency depending jointly on the mass of the body and on the velocity of the rotation. It is the former of these conditions that is now being taken advantage of. For if we have a number of particles all revolving with the same velocity, but of different specific gravities, and if we allow them to follow their tendency of moving off at a tangent, it is evident that the heaviest particles having the greatest mass will move with the greatest energy. The result is, that if we take a mass of such particles, and confine them within a circular casing, we shall find that, having rotated this casing with a high velocity, and for a sufficient time, the heaviest particles will have settled at the outside, and the lightest at the inside, while between the two there will be a gradation from the one to the other. Here, then, we have the means of separating two substances, solid or liquid, which are ultimately mixed up together, but which are of different specific gravities.

The above are only a few of the many instances which might be given to prove the close and reciprocal connection between physical science and mechanical engineering, taking both in their widest sense.

A HIGH TOWER PROJECTED AT PARIS.—The Washington Monument may not long enjoy its pre-eminence as the highest structure in the world. An iron tower of the hight of 1000 feet is to be erected in the grounds of the French Exhibition in 1889. An elevator, the safety of which is guaranteed, will communicate with the summit, and visitors to the exhibition will be taken to the top for a small fee. Those who have the courage to make the ascent will enjoy an almost uninterrupted view for nearly 100 miles all round. The tower will also be used for astronomical and meteorological observations, for experiments in optic signaling, for the investigation of certain problems in experimental physics, and for various other scientific purposes. It will, perhaps, be remembered that a tower of the same elevation was spoken of in connection with the Centennial Exhibition at Philadelphia, but the necessary financial backing could not be had for the enterprise and the project was dropped.

A GOOD, CHEAP MUCILAGE.—Allow one part of white glue (or gelatine) and two parts of gum arabic to swell in ten parts of water; then dissolve, after having added one-fourth part of white sugar, at a gentle heat; strain if necessary. To prevent this mucilage from spoiling, add a few drops of carbolic acid or oil of cloves.

USEFUL INFORMATION.

Luminous Paint.

Luminous paint continues to make slow but steady progress in its application to innumerable useful purposes. Among its most recent applications may be mentioned tapes for field use at night by the Royal Engineers' department. Starting from a given point toward the front, the men leave a trail of luminous tape on their track, and on reaching a given point they mark the contour of the earthworks to be executed by the same means, paying out the tape as they return toward the camp. The working party then follow the outward trail, execute the work and return to camp without having discovered a single ray of light to the enemy. The German War Office authorities have experimented with the paint for the purposes of night attack, and Lieutenant Beppe, of the Belgian School of Gunnery, is investigating its merits in the same direction. Our own government, says the *Building and Engineering Times* (London), are also using painted framed glasses, or Aladdin's lamps, as they are called, for internal boiler inspections. General Lord Wolseley also took with him a luminous compass for the Nile expedition. It has also been applied in some large establishments to the fire buckets which are thus easily found in the dark. A South Eastern Railway third-class carriage has the interior lined with the paint on the back of glass.

AMMONIA FOR FLOWERING PLANTS AND STRAWBERRY PLANTS.—A writer in London *Gardeners' Chronicle* says: Last year I was induced to try an experiment in chrysanthemum growing, and for this purpose purchased one pound of sulphate of ammonia, which I bottled and corked, as the ammonia evaporates very rapidly. I then selected four plants from my collection, putting them by themselves, gave them a teaspoonful of ammonia in a gallon of water twice a week. In a fortnight's time the result was most striking, for though I watered the others with liquid cow manure, they looked lean when compared with the ammonia-watered plants, whose leaves turned to a very dark green, which they carried to the edge of the pots until the flowers were cut. As a matter of course, the flowers were splendid. The ammonia used is rather expensive, as I bought it from a chemist's shop. This year I intend getting agricultural ammonia, which is much cheaper. I have also tried it on strawberries, with the same satisfactory result, the crop being nearly double that of the others. It is very powerful, and requires to be used with caution.

FENCE POSTS IN SAND.—A gentleman, says the *Connecticut Farmer*, recently said that he had a tall gate post which had stood him for over twenty years. Chestnut or oak, if we mistake not. When setting the post he filled the hole with sand brought from the beach, instead of the loam dug from the hole. This post sustains a heavy yard-gate made of tight boards, and the fact of its stability seems worthy of notice. "Do you think a post set in sand will not rot?" "Well, it may not rot as soon as if set in common earth, but I do not think that is the reason exactly why the post stands so well. When the outer shell of a post decays the hole becomes too large for the post, although the post may stand for years longer before it breaks off. As soon as the looseness occurs, the fence is at the mercy of every wind, and is racked and twisted; nails are broken and boards drop off, while gate posts drop their burden on the ground. But this sand, I think, as the post decays, settles into the vacancy, all the while holding the post firmly." "It acts as a sort of automatic filling, then?" "Yes, I think so."

WHITE BRICKS.—The French are making a new ceramic product from the waste sands of glass factories, which often accumulate in immense quantities so as to occasion great embarrassment. The sand is subjected to an immense hydraulic pressure, and then baked in a furnace at high temperature, so as to produce blocks of various forms and dimensions, of a uniform white color, which are composed of almost pure silex. The bricks, when plunged in chlorhydric and sulphuric acids, show no trace of alteration. The product has remarkable solidity and tenacity; it is not affected by the heaviest frosts or by the action of sun or rain; it resists very high temperatures, provided no flux is present; it is very light, its specific gravity being only 1.5; it is of a fine white color, which will make it sought for many agricultural effects in combination with bricks or stone of other colors.

A FORTUNATE "REMARK."—It was a chance remark that led Henry Bessemer to his method of improving gun metal. After many experiments, and being sneered at as an enthusiast, iron that cost $35 a ton was turned into steel worth from $250 to $300. In 14 years, his experimental works, having returned 57 fold, were sold for 24 times the subscribed capital, and his manufacture is estimated to be worth $100,000,000 yearly.

A NEW VEGETABLE LEATHER.—This product, invented by a company in Paris, and which possesses all the properties of leather, besides being thoroughly water-proof and a non-conductor of electricity, is composed of a mixture of three kilogrammes of gutta percha, 900 grains of sulphur, one kilogramme raw cotton, 600 grains of zinc white, and 250 grains of antimony oxide. After having been mixed, the compound is vulcanized with steam, similar as is done with caoutchouc. As indispensable constituents of this leather must be designated gutta percha and sulphur, while the other ingredients can be replaced by chemicals of a like nature. Also the quantity proportions of the several components can be varied, according to the purpose for which the product is intended. The above manner of composition is recommended for the manufacture of soles and heels.

WATERMELON OIL.—Experiments have been made by M. Lidoff with a view to defining the quality of oil contained in the seeds of a peculiar variety of the watermelon plant extensively grown in the south of Russia. According to a description of the process in the *Corps Gras Industriels*, the seeds are dried at a temperature of 266° Fahrenheit, after which the oil is extracted in a Tharn apparatus. By this method there was obtained a quantity ranging from 24 to 25 per cent of a lubricating oil, with a density of 64° Fahrenheit of 0·9298. It absorbs atmospheric oxygen very rapidly, an augmentation of about one quarter per cent taking place within three days. M. Lidoff thinks watermelon oil suitable for culinary purposes, but fears that its extraction would be too costly to allow of its coming into general use.—*Ex.*

CEMENT FOR GLASS, PORCELAIN, ETC.—Take some old, soft cheese and grind it in a mortar, washing it well at the same time with hot water. After the soluble matter is all washed away, a mass of nearly pure caseine will remain. This should be squeezed in a cloth to express moisture, dried, reduced to powder, and preserved in a closely stoppered bottle. When required for use, a small quantity should be ground up with a very little water, enough to make a thick, viscid paste, which must be used at once; as it hardens quickly, no heat should be used. Only such a quantity should be mixed as may be immediately needed, as, after it once hardens it will not dissolve, and neither heat nor moisture has any effect upon it.—*Popular Science News.*

TURPENTINE AND RESIN IN THE LAUNDRY.—Turpentine in small quantities may be used in boiling white goods, to great advantage, as it improves the color, and the boiling drives off all odor. Resin in soap is quite another thing; it injures and discolores some goods, and shrinks woolens. Soap men argue that on account of the turpentine in the resin, it assists in the washing. It is used as a filler, and to make the soap hard and cheap. It is a fraud on the consumer.

GLYCERINE IN WINE.—The mellowness of old wine has been found by experiments in Germany to be due to an increase in the quantity of glycerine that it contains, rather than to a decrease of tannin. The mellowness of the drinker depends on the quantity of the wine.

GOOD HEALTH.

The Children of Alcoholic Drinkers.

Dr. Martin, of the Salpetriere hospital, Paris, has made a series of observations, stretching over a period of years, on nervous affection among the children of alcoholic drinkers. In 83 families, where one or more members showed nervous excitability, traceable to alcoholic origin, there were 410 children. Of these, 108, more than a quarter, had convulsions: and in the year 1874, 169 were dead, 241 were still alive, but 84, more than one-third of the survivors, were epileptic.

Again, alcoholism is very apt to develop itself at a very early age, among the children of alcoholic drinkers. The existence of this evil is not sufficiently recognized by medical men. Dr. Thomas More Madden has met with several cases of acute and chronic alcoholism in children of less than eight years of age. In most cases of juveuile alcoholism, the trouble seems to be inherited, more especially when the mother is an inebriate. Intemperance in women becomes, therefore, a subject of extreme importance. Oftentimes, it results from the too general custom of administering stimulants for the relief of dysmenorrhœal pain. In such cases "this unkind nepenthe" is frequently employed in gradually increasing doses, until the victim of dysmenorrhœa becomes an habitual inebriate.

Small Bed-Chambers.

There is reason to believe that more cases of dangerous and fatal diseases are gradually engendered annually by the habit of sleeping in small, unventilated rooms than have occurred from a cholera atmosphere during any year since it made its appearance in this country. Very many persons sleep in eight by ten rooms, that is, in rooms the length and breadth of which multiplied together, and this multiplied again by ten for the height of the chamber, would make just 800 cubic feet, while the cubic space for each bed, according to the English apportionment for hospitals, is 2,100 feet. But more, in order "to give the air of a room the highest degree of freshness," the French hospitals contract for a complete renewal of the air of a room every hour, while the English assert that double the amount or over 4,000 feet an hour is required. Four thousand feet of air each hour! And yet there are multitudes in the city of New York who sleep with closed doors and windows in rooms which do not contain a thousand cubic feet of space, and that thousand feet is to last all night, at least eight hours, except such scanty supplies as may be obtained of any fresh air that may insinuate itself through little crevices by door or window, not an eighth of an inch in thickness. But when it is known that in many cases a man and wife and infant sleep habitually in thousand feet rooms it is no marvel that multitudes perish prematurely in cities: no wonder that infant children wilt away like flowers without water, and that 5,000 of them are to die in the city of New York alone during the hundred days which shall include the 15th of July, eighteen hundred and ——! Another fact is suggestive, that among the 50,000 persons who sleep nightly in the lodging houses of London, expressly arranged on the improved principles of space and ventilation already referred to, it has been proved that not one single case of fever has been engendered in two years! Let every intelligent reader improve the teachings of this article without an hour's delay.—*The Builder.*

A WORD OF CAUTION ABOUT INK PENCILS.—We have to utter a word of caution about the ink pencils which have come so much into vogue lately, says the New York *Times*. A most useful implement to the business man, this innocent-looking pencil, can be converted into a treacherous friend, and on no consideration should it be used to write the signature of any one. The composition of the pencil is a peculiar combination, highly poisonous in itself, and—herein lies the danger to signature writers—competent to give off two or more impressions on damped paper—not tissue paper, be it understood, but ordinary writing paper. Our attention was first directed to this peculiarity by an astute official of the Bank of New Zealand, and subsequent experiments proved the easy practicability of making a clear copy of the filling in of a check with this ink pencil. First the writing of the check is transferred—upside down, of course—to a slip of damped paper, and from that transferred—right side up—to another slip of damped paper. We tested this recently in the case of a check written with the ink pencil and sent in from the country, and by simple hand pressure obtained a very perfect copy of the transferrable parts of the document.

A CAUSE OF BLINDNESS.—Inasmuch as blindness has frequently resulted in babies from inflammation of the eyes following childbirth, the following directions are given to prevent that disaster: First, immediately after the birth of the baby, wipe the eyelids and all parts surrounding the eyes with a soft, dry linen rag, and soon after wash these parts with tepid water, before any other part is touched. If any discharges appear, separate the eyelids with the finger and thumb, and wash out the matter by allowing a gentle stream of lukewarm water to run between them from a piece of rag held one, two or three inches above the eye. Repeat this cleansing process every half hour, for the saving of the sight depends on the greatest care and attention to cleanliness. It is the discharge which does the mischief. Rags are better than sponges, and should be destroyed at once.

WEIGHT AND HIGHT OF MAN.—It is well that all persons should know what the normal weight of man really is: The following shows the relative hight and weight of individuals measuring 5 feet and upward: 5 feet and 1 inch should be 120 pounds: 5 feet 2 inches should be 126 pounds; 5 feet 3 inches should be 133 pounds; 5 feet 4 inches should be 136 pounds; 5 feet 5 inches should be 142 pounds; 5 feet 6 inches should be 145 pounds; 5 feet 7 inches should be 148 pounds; 5 feet 8 inches should be 155 pounds; 5 feet 9 inches should be 162 pounds; 5 feet 10 inches should be 169 pounds; 5 feet 11 inches should be 174 pounds; 6 feet should be 178 pounds.

HIVES.—This trouble is caused by a perversion of the digestive functions, accompanied by a disturbance of the circulation. It is not attended with danger, and is of importance only from the annoyance which it causes. Relief may be obtained in most instances by the use of cream tartar daily to such extent as to move the bowels slightly. Make a strong solution, sweeten it pleasantly, and take a teaspoonful, say after each meal, until the effect above mentioned is produced, and continue the treatment until the hives cease to be troublesome.

FOR ACUTE RHEUMATISM.—The *Quarterly Therapeutical Review* says that the oil of wintergreen, mixed with an equal quantity of olive oil or liniment un saponis, applied externally to inflamed joints affected by acute rheumatism, affords instant relief, and, having a pleasant odor, its use is very agreeable.

SIMPLE FRACTURES may be adjusted by almost any one. Get the limb as near as possible in the natural position, and then send for a doctor. There is no great urgency in such cases.

ECLECTICS.—There are 600 eclectics practicing medicine in the State of Kansas. They have a prosperous State society, and are about to establish a medical college.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

PLYMOUTH.—Cor. Amador *Ledger*, Jan. 10: The machinery for the hoisting works to be erected over a new shaft on the Empire property is all on the ground, and the erection will be pushed ahead as speedily as possible. The new shaft is about 150 yards from the old one in a north-easterly direction. It is now 200 ft deep, and the intention is to sink 400 ft deeper.

CARLISLE.—The Carlisle company, operating the Laphata quartz claim in Willow Spring district, crushed a quantity of rock recently in a two-stamp mill, to test the quality of the ore by mill process. How it turned out we are not informed. Sinking operations are now being prosecuted. A breakage in the machinery of the Keystone hoisting works occurred two weeks ago, which took the whole of last week to repair. Six men are employed in crosscutting and sinking at the Mediam mine at Amador City under the supervision of Mr. Richards. The prospects are reported to be very favorable for the development of a valuable mine. Messrs. Shugert and Morgan have purchased a Huntington roller quartz mill, to be erected at their mine in Hunt's gulch.

Alpine.

MINING NOTES.—Alpine *Argus*, Jan. 1: Messrs. Coleman and Wallis have stopped operations at the Raymond mine for the winter. They came down from the mine yesterday, and report having a difficult time in getting into town through the snow, which was 4 ft deep at the mine. J. P. Ray of Monitor recently struck into a better looking quality of ore in his mine than has ever been discovered heretofore. No assay of the new ore has yet been made, but the appearance gives much encouragement and it is believed that the main body of ore in the mine has been tapped.

WASHINGTON MINING DISTRICT.—Grass Valley *Union*, Jan. 10: Joseph A. Everett, who has been engaged in building the new ten-stamp quartz mill for the Cornucopia and Secret Treasure Company, in Washington township, has returned home, and says the mill is completed and is now ready for operation. The mill will be run by water under heavy pressure, being taken up after being first used at the Lindsay mine, which is some hundreds of feet higher on the mountain side. The mill will be well supplied with quartz, as the company has four distinct ledges in its location. Beside the Cornucopia, within a circuit of one mile, are the Yuba, Eagle Bird and Lindsay mines, all run by water power, and all running constantly on pay ore. Besides these three there are a number of other locations upon which developing is going on, and the general prospects are very encouraging, and during the coming spring other mills will be put up. The district is attracting much attention from quartz miners, and a large number are at work prospecting, whose numbers will be increased when the winter storms are over. The district bids fair to become noted for the extent of its quartz mining.

El Dorado.

GREENWOOD.—Cor. *Mountain Democrat*, Jan. 10: "The heavy rain has given our miners a full supply of water, and work is going on with good prospects in many claims long idle, with every indication of a prosperous mining season. Martin Bliebtreu, a few days since, obtained a large and handsome specimen in quartz on the Cedarberg croppings, for which he has refused $125 in its native state. The Revenge mine is at work steadily, with encouraging prospects.

STARTED UP.—On Monday of last week Thomas Alderson put a full force of men at work at his gravel mine on Cedar Ravine. This mine had been shut down for about three weeks, being flooded by the late heavy rains.

Inyo.

CERRO GORDO.—Inyo *Independent*, Jan. 10: Mr. Boland has made an examination of the mines at Cerro Gordo and finds the old workings badly caved, especially the Union tunnel. It will take some time and a good deal of labor to put the mines in a condition for getting out ore again. The work will be pushed ahead as rapidly as possible, however. A mistake was made in stating that Mr. Boland had leased the furnaces; his lease covers but the right to work the mines.

ANOTHER STRIKE.—Arizona *Star*, Jan. 10: Special advices from Globe say there is prospect of serious trouble between the management of the Old Dominion Copper Co. and the Miners' Union. The mines and smelters have been closed down since Monday, pending arrival of coke, which has been delayed owing to the heavy condition of the roads. This morning five men were put to work on the surface at the smelter, at $3 per day. Members of the union learning of this, called a meeting, at which a committee was appointed, with instructions to wait upon the five employees, working at reduced wages and order them to quit. Superintendent Trippet, learning of this procedure, immediately had all work cease; also withdrawing proposals for contract work in the mine. The union held another meeting this afternoon, but the result of their deliberations could not be learned. They marched down Broad street in a body, numbering forty-nine. This conflict coming at a time when the price of copper is so low, and the outlook discouraging, is a serious matter for Globe.

Nevada.

RICH ROCK FROM THE HARTERY.—Grass Valley *Union*, Jan. 10: The Hartery mine shut down recently owing to the contemplated removal of the machinery, which did not belong to the company, and preparatory to putting in stronger power to do the pumping and hoisting. Before the water raised in the shaft, however, to stop all work, James Bays and his partners, in all four persons, continued work on an upraise between the first and second levels, 240 ft south of the shaft, and in 8 days work took out a lot of rock which proved very rich, and in pounding it out in hand mortars 80 pounds of sand of one lot gave a yield of $1,280, and the remainder yielded $580, or in all $1,860. This was taken from a small ledge, from one to eight inches in thickness, which was a spur from the main ledge. The work was done under great disadvantage, and the men had to quit their labors, leaving rich rock on account of the water raising to the hight of the second level and driving them out. When the mine shut down tributers were taking out rock in the levels north of the shaft which gave a yield of $33 per load. The appearance of the mine was quite encouraging, and will justify the owners, Wm. Loutzenheiser and partners, to resume operations during the present season by putting up new and stronger machinery and to conduct operations systematically. The good returns of the mine for the past few months have been such as to show that the Hartery can be made a regular gold producer.

FINAL CLEAN-UP.—Grass Valley *Union*, Jan. 14: The final clean-up of the tribute rock from the Hartery mine, taken out before the mine shut down, was made on Monday. The tributers, some ten in number, were at work from September 20th to December 15th, and the lowest of their rock was $8.40 per load and the highest $119.85, the average being $39 per load—a very satisfactory result. It is expected that work will be resumed on the mine during the coming season, with stronger and better machinery than heretofore used.

THE CHAMPION.—*Transcript*, Jan. 11: Good ore is coming out of the Champion mine in two places—from the shaft on the hill near the Nevada City hoisting works and from the shaft which starts in the tunnel about 100 feet from the entrance. All that the Champion needs is well directed prospective work to make it a large and steady producer of bullion.

Plumas.

GREEN MOUNTAIN.—Greenville *Bulletin*, Jan. 7: During the late storm, the mill was idle four days. The heavy rains made repairs on the ditch necessary. The water supply at present is not good, and it may be necessary to turn the water off and clean out the ditch. Work in the mine is progressing favorably, the ore is of good quality, and steady running of the mill would produce a good profit for the company. If no unforeseen delays occur, the Sulphuret cbute will be reached in two weeks.

Shasta.

NOTES.—Shasta *Democrat*, Jan. 7: We are informed that agents for W. T. Coleman are negotiating for the purchase of one or two mines in the "Old Diggings" district. The late storm having furnished an abundance of water, the miners around Copper City are putting in their best licks. The people there are jubilant over the good prospects of re-opening the Winthrop mine at an early day. Richard M. Johnson has been engaged the past summer developing Hull, Taylor & Co.'s coal mine in Big Bend of Pit river. He brought down a quantity of coal with him and experts pronounce it of first-class quality. The bad weather and roads have unfortunately retarded the progress of the erection of Coleman's fine quartz mill at the Niagara mine. Some of the machinery yet remains at the depot to be shipped by team to the mine. We want to see this mill in successful operation, for we know it will give a boom to the mining interests in the French Gulch district. James Feour, of French Gulch, was in town last week and reports good prospects ahead in that rapidly-improving mining district. For several months past he and his partner have been hard at work developing their ledge on the Deadwood and French Gulch divide, but on account of snow have stopped work until winter breaks up. They have several tons of ore on the dump that is rich in free gold and the ledge looks better as they go down. Garber & Co., of Portugese Flat, who about a year ago purchased the Bob Pitt mining property at that place, after getting everything in shape and spending considerable money on hydraulic mining machinery, a few days ago commenred active operations on their claim to drive things lively. This has long been considered a rich claim, and the new proprietors are sanguine of cleaning up a good pile in the spring. Other miners in the district are also at work.

CENTERVILLE DISTRICT.—Cor. Shasta *Democrat*, Jan. 7: While we hear from our neighboring towns and mining districts, let us say that we are in the land of the living, and while we say nothing of our mining camp, we can and do produce as rich gold and silver-bearing quartz as any other camp in the county. We have the Silver King mine, owned by Brincard & Lowery, that is rich in free-milling silver ore and assays from $50 to $200 per ton, and the parties intend developing this mine as soon as spring opens. John Doeblin, of Muletown, also has a good gold-hearing quartz mine which he has bonded to a San Francisco company. Work will soon be commenced. It is a large ledge from two to three ft in width and the croppings will mill from $8 to $15 per ton. Stanley Myers, of Shasta, while hunting for deer along the Muletown mountain discovered a ledge from twenty inches to two ft in width which is very rich in gold and gold-bearing sulphurets, and is now running a tunnel to prospect it in depth. As it is located on the highest peak in that range of mountains it is no trouble for him to tap his ledge four or five hundred ft in depth by a short tunnel, and if it should prove to be as rich as on top, Stanley will not have to go to New River to hunt a bonanza. While we speak of quartz, we must not slight gravel mines in this camp. George Reese, one of the old pioneer miners, has fitted up his placer claim near Texas Springs and is now ready to cut his gravel bank. He anticipates a rich clean-up, as the late rain-storm filled his 20-acre reservoir, so he will not want for water even if the Clear Creek ditch is not brought in here this winter. Isaac Hare has commenced work in his Bulgin (?) Gulch claim, and has rebuilt his shooter so as to flood out the tailings and to pipe down his gravel bank to a good advantage. Brincard, Lowery and B. B. Martin are running a tunnel into their blue gravel claim near Jackass Flat. They are in with their tunnel about 200 ft and are getting good prospects. If the Clear Creek ditch was rebuilt so that the miners could have water I am sure there would be many more mines in operation and it would make this one of the liveliest camps in the county.

Sierra.

WORK SUSPENDED FOR THE WINTER.—*Tribune*, Jan. 10: Van Slyke & Maxon have suspended operations for the winter at their mine in Hog Canyon. They have done considerable work there this summer, having sunk one shaft on the ledge to a depth of 65 feet, and two or three others to a lesser depth. The ledge is seven to nine feet wide in the bottom of the 65-foot shaft. The ore does not show much free gold, but when it is pounded up in a mortar and panned out it yields the biggest kind of prospects. The parties propose to start up work at the mine again next spring on a more extensive scale. They undoubtedly have the making of a big mine there, and although they are not possessed of an abundance of capital, they will find a way to develop their mine.

NEW MACHINERY AT THE ALASKA MINE.—A pump weighing 26,000 pounds has been ordered and is expected at the Alaska mine some time this month. It will be hauled there whenever the roads are in good enough condition. Two loads of machinery arrived at the mine last week. They will not be able to get the rock breaker through from Nevada City till the roads improve.

BULLION SHIPMENT.—Thirty-two thousand dollars in bullion was shipped from the Alaska mine, at Pike City, to the San Francisco Mint recently. They are making regular shipments of bullion from that mine. The above is only a drop in the bucket. There are many more mines like the Alaska in Sierra county, if they were only developed.

Santa Barbara.

THE GYPSUM QUARRY.—Cor. Santa Barbara *Press*, Jan. 10: Mr. C. H. Clark, of the Point Sal Quarry, writes us as follows: We have shipped 8 cargoes of gypsum from here this season over the wire cable. The quarry of gypsum is inexhaustible. We have from 1½ to 2 miles to haul by team. It is mined the same as coal, but is of the opposite color, gypsum being white, some blue, and very rarely brown or dark red; one not accustomed to seeing gypsum would call it quartz rock. It is solid and apparently as firm and hard as any rock. It has, however, no grit and will not dull a knife to cut it. It is easily drilled. We use powder as in any rock to blast it out, and it is broken in pieces convenient to handle, and shipped in bulk to San Francisco, to the Golden Gate Plaster Mills, the only mills on this coast. Since they have been working the rock from here, it is claimed by many who use a large quantity of plaster that it is a better article than can be had from the East. This is claimed to be the finest gypsum on the coast. Many people will show a piece of transparent mineral resembling isinglass and claim it to be gypsum, but it is found usually in clay and on the outside of gypsum deposits, but is of no value whatever. Pure pieces of white gypsum when broken in lumps could not be told from pure crushed sugar by looking at them, which will give a good idea of what it looks like. Take the broken rock as we handle it and about 3 ft cube will make a ton, which is 2,240 pounds.

San Bernardino.

DANBY.—Cor. *Foothill Tidings*, Jan. 10: Danby is situated about 600 miles from San Francisco, on the line of the Atlantic and Pacific Railroad, and promises to be a large mining camp in a few years, being surrounded by very rich paying silver ore mines. Prospectors with burros and light wagons travel through here daily, en route to Calico and Providence, the principal mining camps of San Bernardino county. A location about eight miles from here was purchased by Schilling and Lindenfeld, of Los Angeles, and is being prospected, and at a depth of twenty ft some rich silver ore is being taken out. Water is very scarce around here. Prospectors within ten miles come here to get water from the railroad tank, which is furnished to them free. The railroad company was given a spring about six miles from here, by the Bonanza King Mining Company, to provide all prospectors and the Bonanza King Company's teams with water at Fenner, where the stage leaves for Providence mining district daily. The Bonanza King Mining and Milling Company is composed principally of eastern capitalists. The shaft is down some 600 ft. Mining down to the third level was done on the chutes which were seen from the surface, but on the sixth and seventh levels they increase in number. The mine was purchased by this company for $3,000, and they have expended for putting up a mill and labor nearly $250,000, which, by this time, has been paid back in dividends. The mill has been in operation for nearly two years, turning out a steady stream of bullion of from $30,000 to $50,000. The Bonanza Company have several claims. The mineral zone on which this company is situated is claimed and located for about six miles distance.

Siskiyou.

THE BLACK BEAR MINE.—Yreka *Union*, Jan. 8: Twelve hundred tons of rock at the Black Bear is ready to be crushed, and no more will be mined until spring. This amount will keep the 32-stamp mill going for two months. Mr. James Gould, a gentleman of great experience in mining, has been appointed superintendent, in place of J. B. Little, resigned. Mr. Little has managed the affairs of the company for some time, and has won for himself many friends during his residence in this county. He will soon leave for below.

Trinity.

GOOD-BYE JOHN.—Trinity *Journal*, Jan. 10: We have been reliably informed that all the Chinamen—some 20 odd—employed in and about the Lambeth mine, in Deadwood mining district, have been discharged, and white labor to the number of ten have taken their place. This action was urged by the foreman, who very wisely had come to the conclusion that ten white men can do the work better and more satisfactory than the 20-odd Chinamen.

THE OWNER.—We learn that the quartz mines recently purchased from Mr. Jacob Holsinger and others in East Fork district are the property of the Yellowstone Mining Company, a San Francisco organization.

NEVADA.

Washoe District.

SUTRO TUNNEL.—Following is the report of progress and details of work in the Sutro tunnel during the month of December: Main tunnel—Repairmen between points 12,800 and 12,900; removed of old timber 24 posts and 11 caps; squared ground and put in 22 posts and 9 caps of new timber; also lagged and braced sets, repaired track in places and cleaned up debris. Main tunnel drain repairs—Between points 11,000 and 11,100, 100 new covers and sides were placed on drain boxes; between 10,800 and 10,900, 300 new covers and four sides; between 10,700 and 10,800, 170 new covers and two sides; between 10,500 and 10,700, 200 new covers and seven sides. North lateral, south of Gould and Curry connection—Repairmen removed 31 posts and 14 caps of old timber; squared ground and put in place 32 posts and 11 caps of new timber; also, lagged and braced sets and cleaned up debris; retimbering completed for a distance of 58 feet and seven inches. North of Gould and Curry connection, 19 posts and eight caps of old timber removed and 20 posts and nine caps of new timber put up; sets lagged and braced and debris cleaned up; distance of timbering completed, 48 feet and six inches. Flow of water in standard gallons per day, 8,852,600.

HALE AND NORCROSS.—Virginia *Enterprise*, Jan. 10: Work was resumed in cross-cut No. 2, on the 2800 level, on Tuesday morning. It is passing through a solid body of quartz that shows occasional streaks and bunches of ore assaying from $5 to $30. Nothing is being done in cross-cut No. 1, nor at the bottom of the winze on the 3000 level. Work will not be resumed at all points until connection has been made between the Combination shaft and the bottom of the winze at the 3000 level.

UNION CON.—The east cross-cut, started at a point 300 feet south of the joint Sierra Nevada winze, is making good headway and is in very promising material, consisting of quartz, clay and porphyry. The diamond drill is constantly kept ahead of the face of the drift to guard against water. On the 1600 level the drain tunnel is being repaired.

COMBINATION SHAFT.—The Cornish pump is running all right and the new hydraulic pump is up and in order. It will probably be started up to-day. They were yesterday filling the supply pipe and making every preparation for a start. So careful have they been in all the preparatory work that there will be no trouble when the pump is finally set going.

ALPHA.—The cross-cuts have passed through the large body of quartz found on the 600 and 900 levels without developing a deposit of ore that would pay for working, though many spots were found that assayed from $5 to $50 a ton. Sinking below the 900 level is the next work in order.

CON. CALIFORNIA AND VIRGINIA.—On the 1500 level are repairing the main drift. Slope No. 6 on the 1750 has been repaired and put in order for the extraction of ore. The repairs to the station and bob pit at the 1900 level have been completed.

ALTA.—The east cross-cut on the 1350 level is finding some very favorable material. In that direction there is a large body of solid quartz. The water rises very slowly and it will be long before it reaches the 1350 level.

SIERRA NEVADA.—The new prospecting drift on the 2300 level is making good headway. It is a favorable formation consisting of quartz, clay and porphyry. Some very encouraging assays have of late been obtained.

GOULD AND CURRY.—The main west cross-cut on the 825 level near the Savage north line is in a mixture of quartz, clay and porphyry of a favorable appearance. Frequent stringers of mineral-bearing quartz are found.

BEST AND BELCHER.—The west cross-cut on the 825 level, at the Gould and Curry north line, is still in vein material of a very promising appearance. Streaks of the quartz are occasionally met with that give low assays.

YELLOW JACKET.—A large amount of low-grade ore is being extracted and sent to the mills, and the exploring drifts are still finding new deposits. Some very rich bunches of ore are occasionally found.

OPHIR.—The west drift on the 500 level is now in the edge of the old workings and the water has about drained out. Good headway is making in the sinking of the winze below the 1500 level.

BELCHER.—The E-street tunnel now has less than 50 feet to go to reach the point where it is expected that low-grade ore will be found. The tunnel is already in a vein formation.

SCORPION.—Good headway is being made in the north drift on the 500 level. The ground during the past week has become softer and more favorable in every respect.

CROWN POINT.—The old upper levels continue to yield a considerable amount of low-grade ore, which is being sent to the mills on the Carson river for reduction.

OVERMAN.—The extraction of ore through the old Petaluma-street tunnel has been discontinued, as it was found to be of a grade too low to pay for milling.

SAVAGE.—The E-street tunnel is into the ledge. Some ore has already been taken out and they are now preparing for regular exploration.

ANDES.—Preparations are being made for the resumption of work in the lower levels.

MEXICAN.—The main south drift on the 2700 level has been cleaned out and repaired.

Como District.

CAPITAL WANTED.—Virginia *Enterprise*, Jan. 10: The miners of Como are deserving of encouragement and good luck this year. Their camp is promising to a great degree, and yet for some unaccountable reason they cannot get capitalists in to develop their properties. At one time, just before the great excitement in Virginia City, the camp had a population of over 3,000, but it is now the habitation of only twenty or thirty people.

Cortez District.

BULLION HILL.—Cor. Eureka *Sentinel*, Jan. 7: The camp was discovered in 1863, and was worked by the Cortez Mining Company for three years under the management of Gov. Chillis. It was then abandoned by the company and left idle until 1870, when the chloriders tackled it, who bave ever since worked it in a desultory manner. Not a single failure has been made where any work or judgment was employed in the mines. Not a dollar of outside capital has ever been used in the development of the camp since 1866. There never has at one time since 1870 been more than 6 men at work here steadily, and for long periods it would be deserted—generally just after a few good shipments of ore would be made. The miners never ship any ore less than $100 per ton, and I know of two ledges in the place which will average $75 per ton. One of them is 20 inches in thickness, and it is opened for 100 ft in length. Both are idle. None of the mines have been worked deeper than 100 ft. At the present writing, Bullion Hill can show the richest bonanza of any camp in the State, which since last writing, has increased in size from 4 ft to 6 ft in thickness, and averages $800 per ton. The happy owners are Gillam Brothers

and Tex. Smith & Co., of the Aurora, have in the face of both of their tunnels small seams of ore which assay from $300 to $4,000 per ton. The tunnels are approaching two interesting places in the mine. At the ores of Bullion Hill are sent to Salt Lake for reduction at a cost of $27 per ton for freight. This is felt to an extent by the miners, for all the ore that has been shipped might be safely estimated to average $200 ton. Here is a list of mines which are working, and the amount produced by each: Maid Queen, $31,000; Silver Fleece, $4,500; Midnight, $12,000; Gillam & Tex, $30,000; Aurora, $9,000. Here is a list of the mines that are idle, and what they have produced in the past, as near as I can ascertain: Roscoe Conkling. $11,000; Lone Star, $36,000; Poorman, $34,000; Ironsides, $25,000; Burling, $40,000; Fitzgerald & Blifford, $20,000; Paymaster, $15,000. Total, $308,000. There are a gr at many smaller claims here which have produced small lots of ore.

Columbus District.

MOUNT DIABLO.—Candelaria *True Fissure*, Jan. 10: The north cross-cut on the sixth level has advanced 17 feet during the week, and the west drift on the same level has been driven 15 feet. The west drift on the fifth level has been stopped for the present and a south cross-cut started near the face of the drift. The raise from the west drift on the fifth level is up 19 feet, and shows a foot of $70 ore. Some $40 ore is being taken from the fifth level near the winze No. 1, and also from the same level near winze No. 2. The intermediate between the third and fourth levels and near winze No. 1, is giving some $50 ore. The intermediate, between same levels near winze No. 4, shows a small bunch of good ore. Nearly above this winze, between the second and third levels, some $150 ore is being taken from a narrow ledge. The stope, between the second and third levels and west of the shaft, is looking about the same. The intermediate, between the first and second levels, is giving considerable high-grade ore. Some ore of fair grade is being taken from the first level.

Pyramid District

ANOTHER STRIKE.—Reno *Gazette*, Jan. 9: A report came in to-day that a strike had been made in the Pyramid Lake mine of ore that goes $1,500 to the ton.

Spring City District.

LIVE YANKEE.—*Silver State*, Jan. 10: Nick Frayer, superintendent of the Live Yankee mine, at Spring City, arrived here yesterday from his mine, and reports very flatteringly of the results of his new concentrating works, which are operated by the Huntington crushers and the Challenge concentrators. By the concentrating process, ten tons of ore are reduced to one ton of concentrations, which contains all the precious metals that were in the whole bulk at first. He showed us specimens of the concentrations, of which he had two large vials with him. These specimens were of ore reduced to an almost impalpable powder, and, as his ores are mostly of the high-grade order, of course they assayed at a high figure. The ores are run through the process of crushing and concentrating, and then in reduced form are shipped to Salt Lake by railroad, where their final treatment takes place. It is said that a higher percentage of the value of the minerals contained in the rock can be obtained by the concentrating process than by any other way. Mr. Frayer says he has power enough to drive six concentrators and two crushers. At present his works contain but two concentrators, but it is the calculation of the company to have two more added at an early date, when 25 tons of ore can easily be reduced per day. The process he uses is something new, and, by the commencing trial, he feels assured that it is a sure success.

Taylor District.

REDUCING FORCE.—Cor. Eureka *Sentinel*, Jan. 10: The Monitor Mining Company paid off all its miners on the 3d instant up to date, and laid all hands off, with the exception of twelve—eleven in the mine and one drill sharpener. As the mill is run by water power, they had to shut it down for the winter season; so it throws some men in our midst out of employment, who are on the work if they could get it. The Argus Mining Company's mill and mine is still running, the death of Mr. Aultman not affecting anything here, although he was a half owner in the property. On account of the heavy discount on silver the manager here was forced to lower wages fifty cents per day—from $4 to $3.50—at the same time assuring his men if silver went up and the mine could afford it, he would put wages back to its old standard of $4.

Tuscarora District.

INDEPENDENCE.—Tuscarora *Times-Review*, Jan. 8: The usual progress has been made at all points, showing no change worthy of mention.

NORTH BELLE ISLE.—The usual progress is being made in north drift, 70-foot level. The face still continues favorable.

BELLE ISLE.—No. 1 upraise, 150-foot level on east vein, has been carried up during the past week six feet; total distance 60 feet. No change since last report.

GRAND PRIZE.—South drift on the 400-foot level has been extended 23 feet; on the 300-foot level 29 feet, and on the 200-foot level 24 feet. The mill will start up to-night to work what ore is out.

NAVAJO.—East cross-cut, 350 level, advanced 13 feet during the past week, total distance 88 feet, showing no change. All work other in and about the mine is progressing as usual. The stopes are producing the usual amount and grade of ore.

ARIZONA.

FROM BISBEE.—Tombstone *Epitaph*, Jan. 9: A friend of the *Epitaph*, writing from the Atlanta mine, near Bisbee says: "As regards the Atlanta mine, it is useless for me to begin to describe the enormous extent of ore bodies (as the report I might give would undoubtedly be shelved with the many other wild cat mining speculations); suffice it to say on our 200-foot level drifting and raising is down to the amount of about 200 feet all in ore of good paying quality. On the 250-foot level but little work has been done, other than running a drift over 100 feet, in which much ore was encountered. The 320 level has developed into an enormous deposit of rich copper. Notwithstanding exploring drifts have been run in different directions amounting to over 600 feet. The whole area will in time pass through the smelters, saying nothing of the continuation of the ore body yet remaining to be explored. A shaft is started for another level below the level referred to, and is much richer in copper than anything yet discovered * * * * The work in this mine was begun on the first day of April last. Notwithstanding the capping of hard limestone which abounds in this zone, yet practical experience often leads to success."

YUMA MINES.—Cor. Arizona *Sentinel*, Jan. 10: There has been much activity among the miners during the going out of the old year and the coming in of the new. Several claims have been re-located in the Gila City range, the Posa mountain, the Cabeza Prieta district, the Pinto and Mohawk ranges, and those who have failed to keep up assessments are left. The new district in front of Mohawk, to the north is receiving considerable attention. There are almost inexhaustible supplies of free milling gold ore, which assays all the way from $5 to $100 per ton; and in order to have an immense bullion output a good stamp mill is only needed. A new district of mineral has been discovered, and has been named the Chloride. It is south of the S. P. R. R. from Tacna. Several locations have been made. The ore assays well on the surface. The veins are permanent and wide and of the true fissured class. There will be news for the public from Yuma county mines during the present year. From the number of fresh horses' tracks made along mountain and mesa, I predict a golden harvest for our County Recorder during the next 60 days.

A RICH STRIKE.—I send by Mr. Douglas some specimens from our mine, the "May Queen" in Silver district. We are now down about 12 feet. We have two feet of ore which will assay from 18 to 200.34 ounces of silver and from forty to sixty per cent lead. We have several sacks of ore out and take out from one to four per day, and have several tons in sight. We have a cut running about 30 feet and a solid vein of galena ore running the whole length, nearly two feet wide. As we go down the ore becomes richer.

TURKEY CREEK.—Prescott *Courier*, Jan. 10: E. T. Johnson, who has just come in from Turkey Creek district, gives the pleasing news that Messrs. Gavin, Morgan and Roberts are once more taking very rich silver ore out of the Pine Spring mine. D. W. Clearwaters is shipping supplies to the Howard mine, from which he proposes to take ore. This mine is about four miles south of Prescott. The old Sterling mine, six miles south of Prescott, has again come into favor, and will, it is said, soon change owners. Mining news from the counties of Yuma, Mohave, Maricopa, Pima, Cochise, Pinal, Gila and Graham gives proof of a revival of the industry.

COLORADO.

GENERAL NOTES.—Colorado *Mining Gazette*, Jan. 7: The Grand View mine, on Seaton mountain, extracts and is shipping large quantities of good-grade ore. Major Kelso, of Georgetown, is shipping ore to this place, and says the market is one of the best in this section. The Maple Leaf mine, on Fall river, is being extensively worked, and the ore is being shipped to the sampling works at this place. There will be such a revival in gulch mining next spring on the south fork of Clear creek as to astonish even an old Alder Gulch miner. The Stover, Humboldt, Mary Foster, Molly Bawn, Little Ute, Chance and Paymaster lodes, in Bullion camp, are now being worked and in good pay. They are working the Silver Cliff lode on Ute creek and have exposed in the breast of the adit, being driven into the mountain, a streak of solid ore one to two inches wide of high grade. Mineral of high grade was struck this week at a depth of 40 ft in the shaft of the Jennie Hedden lode, Spring gulch. This is the property of our enterprising business man, Mr. William Townsend. The depth of snow in the camps surrounding Idaho Springs surpasses anything that has ever been seen for years. Until a change of weather takes place it will be impossible to furnish supplies to the mines. The Ettie M. Beck is the name of a new discovery in Gold Dirt mining district, by Mr. Bailey, of Denver. The quartz at the surface pans well in gold and is in close proximity to his mill.

ELK MOUNTAIN.—*Pilot*, Jan. 10: Everything at the Forest Queen is working smoothly. The concentrator is kept busy and is doing very good work. They have recently increased their working force, and will do much toward keeping the ore haulers busy. At the Bullion King things pursue the even tenor of their way. At present an upraise is being made for an air shaft, the bad air having bothered considerably of late. They are shipping some very fine ore. The tunnel on the Ruby Chief has reached a drift in the old workings. The drift with which connection was made is ninety ft from the surface, and connection was made by an upraise of seventeen ft from the tunnel, which shows a depth of 107 ft. The contractors, who were to take their pay from the mine, in ore, will begin shipping immediately. The Chief will be a steady producer the coming season. Work at the Great Eastern continues and ore is good. Although one vein has been cut at the Richmond, the tunnel is still being driven ahead. At the Augusta nothing but development work is being done, in fact this is all that can be done up here in the winter season. On Slate River the Monitor is working quite a force and considerable ore, much of it low grade, is being taken out. The Big Elephant is working a small force developing and will probably be among the producers this season.

IDAHO.

FROM ATLANTA.—Idaho *Statesman*, Jan. 6: Mr. Thos. Finnegan came down from Atlanta, arriving here on New Years. Mr. Finnegan has been at Atlanta since the 1st of June, doing the mason work for the new Atlanta mill (Pettit's mill). The Atlanta mill started up about the 15th of December and will continue running all winter. They run from 15 to 20 tons a day, and the yield is satisfactory. The Atlanta mill is working 15 stamps, and will place five more the coming year. The Tahoma mill started up early in the fall, and has been running for several months and will run all winter. This is a new ten-stamp mill and the ore pays well. Atlanta is really a live camp. The snow is about three feet deep and the weather but moderately cold. They have plenty of supplies for all winter.

CŒUR D'ALENE.—Butte *Miner*, Jan. 7: Mr. Eugene Morier, who has just arrived from the Cœur d'Alene country, informs us that but little work, comparatively, is being done in that country at present. About three feet of snow covers the ground and has obstructed operations. Mr. M. says but half a dozen claims are being worked on Prichard creek, and those at a great disadvantage. Since the great stampede, those who went to stay, have prospected with good results, Trail gulch, heading about two miles from Prichard creek and emptying into Beaver creek has proved wonderfully rich. Two side gulches, viz. Placer and Potosi are being worked and good wages being taken out. The Dutch Jake and Van Dorn bars in Trail gulch are doing well, several rockers being at work daily. The water is furnished from snow, melted in five gallon oil cans and a sufficient supply gotten to wash out big wages. The Myrtle claim which is owned by Messrs. O'Connor, Mooney, Jimmy Osburn and Buckingham is situated at the mouth of Placer gulch, and has proved a most valuable investment. The first two day's work after purchase turned out dust enough to pay back all the money advanced. The lower claim has been worked by 12, 14 and 20 men. At present six men are engaged sinking a shaft to the bedrock on the upper claim. A large over-shot wheel is at work carrying water from the bottom of the shaft to the surface. The Myrtle Co. has been paying their men from $3 50 to $4 per day, and two of the hands have received $5 per day. Several rich nuggets have been found and several thousand dollars worth of dust taken from the two claims. The country will be more generally prospected next spring and summer. Huzzy bank has done a good business. Very many will return in the spring and resume work. The entire county will be overhauled and every foot of it generally prospected. Mr. M. says the mines were so greatly misrepresented that thousands went there only to meet with disappointment.

MONTANA.

BONDED.—Butte *Miner*, Jan. 7: The Molly McGregor mine, lying in the Boulder district has been attracting considerable attention for the past year because of the valuable ore extracted from its internal workings. The mine is owned by John H. Curtis, J. R. Boyce, Jr., A. G. Clark, and Col. C. D. Curtis. Development of the mine has proven the early prediction as to its value. A vertical shaft has been sunk 110 ft on a vein of ore and from the 110 ft station levels were run 50 ft east and west in bodies of handsome galena ore which assays from 75 ounces to 125 ounces in silver and 60 per cent lead. The workings give such evidence of true fissure vein that Mr. C. Moore recently took the mine under bond for a Connecticut Co. and will work it for one year. One fourth of the ore extracted goes to the present owners, Specimens of the ore may be seen at the office of Curtis and Majors. The Parnell lode, adjoining and south of the Geneva, owned by P. J. Hamilton and J. H. Curtis is now under bond to a California company represented by W. H. Davis of San Francisco. The Parnell vein is opened by several shafts from 15 to 20 ft in depth each one of which shows the vein. Several tons of ore are on the dump. The assays show from 45 to 150 oz. silver. The ore is free milling and easily extracted. The bond runs for six months and one fourth of the ore taken out goes to the owners provided the mine is not taken. Those familiar with the ores and the location are satisfied that the property requires but a touch of the hammer to make it one of the best paying claims in Silver Bow county. Work will be heavily pros cuted fn the early spring.

CLEAR GRIT.—*Inter-Mountain*, Jan. 6: The Clear Grit is being actively worked under contract by Henry Williams, who with a force of 30 men is extracting from the 320-ft west level 25 tons of ore daily. Bucket samples yesterday averaged $40 in silver and from 10 to 15 per cent copper. Joseph Daft & Co., who have a lease on the Marie, north of Waterville, are taking out several tons daily of high grade silver ore which is yielding a handsome profit. A steam hoist will soon be in operation on the Amy-Silversmith as a result of the greatly improved appearance of that rising property. Adam Farraday began work to-day on the west extension of the Morning Star, where he has some of the. old time quality of ore.

NEW STRIKE.—Butte *Miner*, Jan. 7: To Mr. G. H. Bibbs, who is somewhat interested in mining matters, we are indebted for some very interesting items of news. Mr. Bibbs arrived yesterday morning from a new prospecting country, about 30 miles south of Butte, where he has discovered a body of fine-looking ore—originally a blind lead—which promises favorably for the owner. The ore brought in assays from 40 to 200, 300 and 500 ounces in silver. It carries chlorides, copper, gold and other metals, but will pass as silver glance rock. The shaft is now down 12 ft on a 10-inch vein, between well-defined walls, and is widening. Timber and water are plentiful, milling facilities good, and its location accessible. The find will undoubtedly prove the starter of a new mining district. Mr. Bibbs also informs us that at Rochester Basin the company's mine, owned by C. B. Ward and Dr. Getchel, has been opened by shaft to a depth of 120 ft. Geo. F. White, the superintendent, is taking gold ore from the 4-ft vein, which goes $10 to the ton, and will have it worked in the new arastra now in course of construction. The Longfellow mine has a shaft 15 ft deep from which the owners are extracting 30 ounces carbonate of lead ores. The Resumption mine, a gold property, has not been worked for a week or two, owing to the absence of one of the owners (Mr. Bolger), but operations will be resumed upon his return. The old Watazicka is lying idle for lack of means to prosecute the work, $50,000 having been expended upon the mine, and over $250,000 taken out. If properly handled the property would prove a veritable bonanza to some practical capitalist. The surrounding country has not been so thoroughly prospected as it should have been, but with an excellent field for faithful work promises well for a brilliant future. Like many other districts, the main drawback is lack of capital.

SHERIDAN.—Cor. Butte *Miner*, Jan. 10: Mines in the Mill Creek district are improving up some. There has been lately a rich strike made on the Big Chief mine, owned by Phillip Frank and H. S. Gilbert. The shaft is down 65 ft. They have four ft of paying ore; one foot assays 1,200 ounces and five inches 2,000 ounces per ton in silver. Mr. A. Cisler is sinking a two-compartment shaft on the Bullion lode. He is taking out 150 and 200 ounces silver ore. In the spring he is going to put in new machinery in his 20-stamp gold mill for concentrating the low-grade ore, of which there is plenty in this camp. R. T. Bateman is working on the Nelly Darby. He has now five ft of concentrating ore, and is confident of striking a big bonanza before spring. Hall, Hardisty, Heman, T. Frank and John Ruhor have four or five valuable locations, each of which will undoubtedly prove a bonanza after being more developed. All these mines are on the same belt, in the vicinity of Brandon, three miles east of Sheridan. Seven miles from Brandon, up Mill Creek, Jim Bradley and Tom Burnham have a gold lode which runs $100 to the ton, worked by arastra.

NEW MEXICO.

THE CAMPS.—Silver City *Enterprise*, Jan. 4: Smith & Christian, of Fleming, have made a rich strike in native silver at Gold Hill. The Ad Valorem, at Gold Hill, owned by Gettings & Miller, shows a vein of about twelve inches which assays nearly $400. A rich strike in horn and native silver was made at Bullard's Peak while doing the assessment work on a claim owned by M. H. Twomey. Cottrell & Lewis, of Gold Hill, are taking out some very fine ore which they are sacking for shipment. The Montana, Sitting Bull and Tenderloot mines, in Gold Gulch, were recently bonded to W. M. Johns for $30,000 on six months' time. The property is owned by Messrs. Kious, Scarritt, Mdone and Miller. Bob McCone is one of the lucky men at Gold Hill. He recently made a strike in brittle silver that assays $1,000 per ton. We have been shown some pieces of ore that will weigh about 150 pounds each, and will run 60 per cent silver, taken from the 500-ft level of the Blackhawk mine. The Mimbres mill has been closed down for some days past owing to the heavy snowfall and consequent bad condition of the roads. W. G. Stegman, Robert Jones and J. G. Park own some exceedingly fine prospects at Gold Hill, upon which work is progressing steadily. The John Henry is considered the richest of the group. The property known as the Plata Verde mining claims, in Shingle canyon, near Georgetown, was purchased last week by McGregor Bros., who intend treating the ore at their mill in Georgetown as soon as the roads permit of the hauling of ore from the claims. These mines are said to contain large bodies of low-grade ore that will pay handsomely if concentrated. A strike is reported upon the Caraboo mine at Fleming running high in native and sulphide of silver. Ore carrying native silver was struck upon this property several weeks ago when work was discontinued on account of the flow of water. The Peacock Mining Company, of which John A. Miller, of this city, is president, made its second shipment of ore to Denver yesterday. Mr. Miller has made arrangements with the railroad company for the erection of an ore-house alongside of the track in the northern part of the city. This will save the expense of handling the ore a second time, and will also be of great convenience in unloading. Mr. Miller expects soon to make arrangements for the erection of concentrating works at the mine. The final payment was made upon the Great American mine in the Swisshelm mountains on Saturday last, and the former owners, Messrs. Clark, Sherwood and Fleming, deeded the same to the Great American mining pool, of which J. F. Seldomridge, of Colorado Springs, Colorado, is president. This property promises to be one of the greatest producers of Arizona during the present year, and the company which purchased it feel justified in erecting works to treat the ores upon the ground, and are figuring with that view at present.

UTAH.

PARK CITY NOTES.—Park *Record*, Jan. 10: A number of small claims up Empire canyon show that the owners have been busy of late doing their annual assessment. The Crescent sampler did not get started until Tuesday, as the brake at the ore house tramway at the mine did not get repaired until the first of the week. Machinists were sent up from Salt Lake this week to repair the pumps and machinery in the Empire, and have everything in shape to start when orders arrive. Sinking was resumed at the Daly works yesterday and will be kept up as long as the water does not come in too fast. This will not interfere with the shipments from the Daly, but it is expected that they will be even heavier than they have been in the past. The new tunnel at the Lucky Bill has been driven in a distance of some 250 feet. Two shifts of men are busily at work on this tunnel and work is being pushed as rapidly as possible. The owners on this claim expect to cut the vein with the tunnel at 450 feet or thereabouts. A large sinking pump has been put in at the No. 3 shaft at a depth of 1,063 feet from the surface. It is intended as a relay for the Cornish pump and will be put in operation in the course of two or three days. A force of men are at work in the building at the mouth of the Ontario tunnel laying a stone foundation and fixing the necessary timbers for putting in a steam pump at that place. The pump is to be used for pumping water from the mouth of the flume into the new tank above the mill.

THE REED MINES.—These mines are situated about four or five miles southwest of Park City, at the head of White Pine canyon where it interlocks with Big Cottonwood canyon. They occupy the southern face of Pioneer mountain, which trends off northeast towards the Daly and Ontario mines, and occupy the same quartzite formation as do the above named mines. Dr. Reed made these locations years ago because of the similarity of geological and mineralogical formation to that of the Ontario mine. He has run nearly 2,000 feet of tunnels with a view to cut these veins at considerable depth, and thus to save hoisting works, pumps, etc. One tunnel enters at the base of the mountain, thus having in view the cutting of all the veins at that depth, and it is now in nearly 800 feet and well nigh up to the two largest veins. It has taken almost constant work for the past three years with the ordinary drill, to drive this length, because of the intense hardness of the rock, a compact, cement quartzite, ten times harder to drill than the ordinary quartzite and hence the slow progress made in the tunnel. Many miners express the opinion, that the principle vein of that locality will prove to be the southwest extension of the Daly and Ontario veins, as they lay upon the same course, but Dr. Reed does not express any opinion on that point, being satisfied with the strength and character of his veins even if entirely confined to that locality. They are in the same course and in the same formation as the Ontario.

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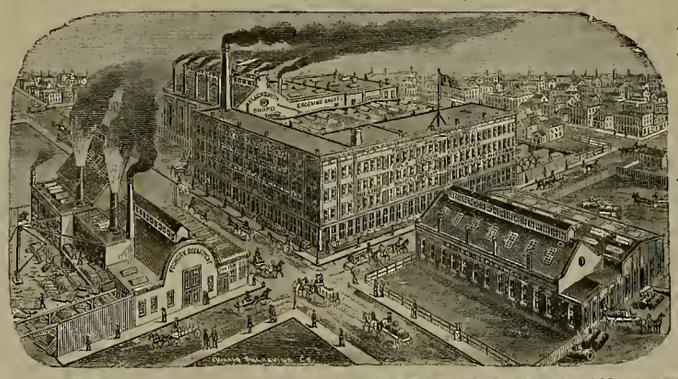

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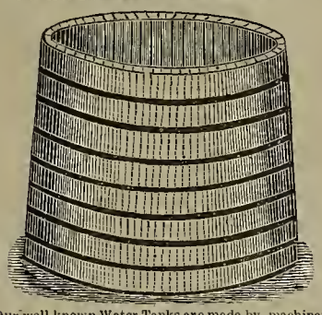

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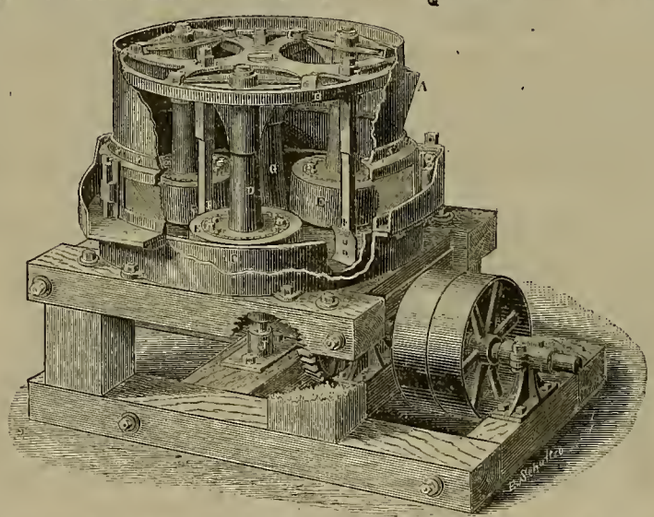

Economy in Expense of Plant. Economy in Cost of Working. Economy in Saving Gold. Economy in Transportation of Machinery. Economy in Cost of Erection of Mill at Mine. Economy in Time Required to Establish Plant (one day only being consumed).

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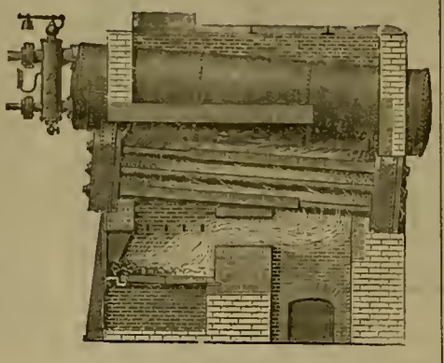

TESTIMONIALS.

SAN FRANCISCO, Sept, 19, 1884.

Risdon Iron and Locomotive Works—Gentlemen: We have had one of your Heine Patent Safety Boilers in use for four months at our Borax Works, in Alameda. It does good work and gives perfect satisfaction. Yours truly,
(Signed) WM. T. COLEMAN & CO.

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Risdon Iron and Locomotive Works—Dear Sirs: I am using one of your Heine Patent Safety Boilers in my Candy Factory on Twenty-Third street, near Valencia. For economy of fuel, safety and efficiency I have never seen its equal. Very truly yours,
(Signed) W. S. TOWNSEND.

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HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

No. 1 (XX) is the Strongest Explosive Known.
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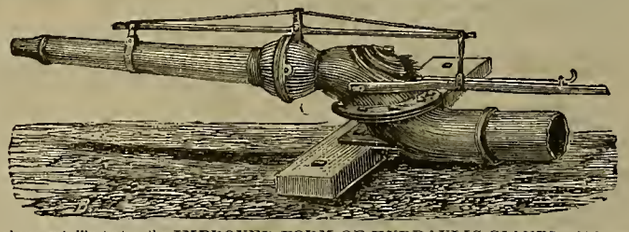

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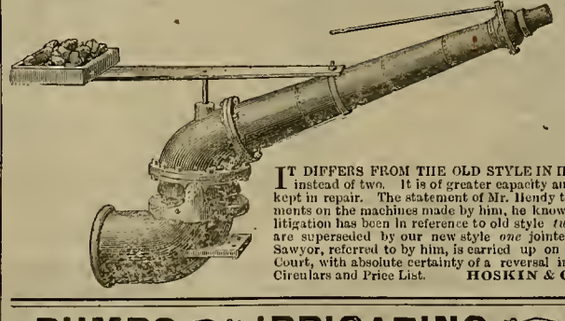

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MACHINE.

IT DIFFERS FROM THE OLD STYLE IN HAVING ONLY ONE JOINT instead of two. It is of greater capacity and more easily worked and kept in repair. The statement of Mr. Hendy that *all* styles are infringements on the machines made by him, he knows to be utterly false. All litigation has been in reference to old style *two* jointed machines, which are superseded by our new style *one* jointed. The decision of Judge Sawyer, referred to by him, is carried up on appeal to U. S. Supreme Court, with absolute certainty of a reversal in our favor. ☞ Send for Circulars and Price List. HOSKIN & CO., Marysville, Cal.

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200 to 10,000 Gallons a Minute.

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Meetings and Elections.

SAN FRANCISCO STOCK AND EXCHANGE BOARD, Jan. 12.—President, S. B. Wakefield; vice-president, H. L. Van Wyck; secretary, M. P. Hall; chairman and caller, B. H. Coit; treasurer, W. E. Norwood.

PACIFIC STOCK EXCHANGE, Jan. 12.—President, C. L. Weller; vice-president, B. Gardiner; chairman, J. B. Bourne; treasurer, R. C. Tobin; secretary, Samuel F. Clough.

VIRGINIA MINERS' UNION, Jan. 10.—President, William Brady; vice-president, William J. Bolan; recording secretary, John D. Cameron; financial secretary, Frank Upton; treasurer, Martin Ford; conductor, Thomas Pendergast; warden, P. H. Fanning; financial committee—John Tate, John L. Finegan and Michael McBride. Library Directors—J. M. Haley, William Erskins, James Byrne, James F. Patterson and Frank Gilmartin.

RUBY HILL MINERS' UNION, Jan. 10.—President, C. E. Allen; vice president, Dan McBride; recording secretary, W. A. Retallack; financial secretary, R. McCharles; treasurer, W. D. Griffiths; conductor, Thomas Harris; warden, Pat Lydon; trustees, Henry Radcliffe, W. H. Byrne, Frank Fitzpatrick, Richard Manuel and Dan MacAskill; finance committee, William Hooper, John Northey and John Callahan; librarians, James H. Ivey, William Chedwidden.

Mining Share Market.

The market for mining stocks still continues in a dull condition. The Comstock mines are all prospecting but nothing of value has been found of late. At the north-end mines they are now doing exploring works in the Sierra Nevada, Union Con. and Mexican at various points from the 2300 to the 2700 level. The Ophir Folks are about opening out the old 500 level, where is a good deal of ground that will pay to work over. In the early days when it cost $50 to work a ton of rock, ore that did not look very rich was left standing, and the miners went on down in search of a place where all would be pure silver. The Crown Point, Belcher, Yellow Jacket and other Gold Hill mines are yielding the usual quantity of ore, and the mills on the Carson river are kept running to their full capacity. The Alta folks are finding some very good quartz to the eastward on their 1350 level.

Bullion Shipments.

King, Jan. 11, $18,541; Alhambra, 1, $22,516; Argus, 10, $11,396; Monitor, 10, $7,455; Ontario, 7, $17,268; Christy, 7, $4,268; Hanauer, 7, $5,450; Crescent, 7, $7,250; Queen of the Hills, 8, $6,500; Hanauer, 8, $65,000; Germania, 10, $6,597; Hanauer, 11, $5,300; Minnie Moore, 11, $7,160; Navajo, 12, $14,000.

TIMIDITY OF MINE OWNERS.—Most people get scared very easily when they have invested their money. This is particularly true as regards mining, and many of the disasters which have crippled our great industry are owing to this fact. It has been the case over and again that a company of men have selected and purchased a property, putting in so much for development. The money has been used up and more called for, when a certain proportion of the company invariably became scared and refused to furnish another dollar. Result, work is stopped—perhaps at a critical time—and a long quarrel is indulged in, one portion of the gentlemen backing out and the other portion trying to pull them in again. After considerable time one crowd contemptuously throws away what it has put in and abandons the mine; about that time the remaining gentlemen begin to shake in their boots, quibble, back and fill, and at last give the whole thing up. This thing has occurred in every camp in the whole Rocky Mountain section and the only reason for it is this natural timidity where money matters are concerned. If men would only select good properties, using care and employing all the means at command and then go into working and developing energetically and fearlessly, much trouble would be saved and the results would be almost universally favorable.—*Rocky Mountain Mining Review.*

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
J. J. BARTELL—Sacramento and San Joaquin Counties.
A. C. KNOX—San Benito and Monterey Counties.
GEO. MCDOWELL—Santa Clara County.
WM. H. COOK—Fresno County.
G. W. INGALLS—Arizona.
W. WHITWELL—Oregon.
M. S. PRIME—Alameda County.
MRS. OZIER—Humboldt County.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

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ASSESSMENTS.

COMPANY.	LOCA	S. NO.	AM'T. LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M and M Co	Alaska	8	50	Dec 10	Jan 11	T J Hay	306 Pine st
Alta S M Co	Nevada	31	25	Dec 24	Jan 9	W H Whatson	302 Montgomery st
Arnold M Co	Arizona	3	1 00	Jan 3	Feb 7	A Judson	320 Sansome st
Best & Belcher M Co	Nevada	31	50	Nov 21	Dec 30	Jan 19	W Willis	309 Montgomery st
Black Bear M Co	California	2	25	Dec 20	Jan 26	Feb 20	W L Oliver	328 Montgomery st
Champion M Co	California	17	10	Nov 24	Dec 29	Jan 19	T Wetzel	522 Montgomery st
Con Amador M Co	California	8	30	Dec 3	Jan 5	Jan 21	F B Latham	408 California st
Copper Mt Con M Co	California	1	05	Dec 3	Jan 13	Feb 10	A L Perkins	310 Pine st
Eintracht Gravel M Co	California	17	05	Dec 9	Feb 7	Feb 16	H Kuntz	209 Sansome st
Excelsior M Co	California	9	50	Sept 2	Dec 31	Jan 22	W J Stewart	215 Sansome st
Exchequer M Co	Nevada	21	20	Jan 2	Feb 5	Feb 26	C C Elliott	309 Montgomery st
Grand Prize M Co	Nevada	17	35	Nov 24	Dec 30	Jan 26	E M Hall	327 Pine st
Happy Valley Gravel M Co	California	5	08	Dec 15	Jan 21	Feb 9	D M Kent	330 Pine st
Hale & Norcross S M Co	Nevada	83	50	Dec 8	Jan 13	Feb 3	J F Lightner	309 Montgomery st
Indian Spring Drift M Co	California	4	05	Nov 21	Dec 22	Jan 21	A B Paul	328 Montgomery st
Lewis Con M Co	Arizona	5	03	Nov 14	Dec 22	Jan 19	J W Pew	310 Pine st
North Gould & Curry M Co	Nevada	8	05	Jan 12	Feb 13	Mar 2	C H Mason	331 Montgomery st
Peer M Co	Arizona	2	50	Jan 14	Feb 19	Mar 16	A Waterman	309 Montgomery st
Peerless M Co	Arizona	3	50	Jan 14	Feb 18	Mar 14	A Waterman	309 Montgomery st
Summer Con M Co	California	2	05	Dec 18	Jan 19	Feb 12	F E Luty	330 Pine st
Silver Lining M Co	Nevada	1	07	Dec 16	Jan 24	Feb 19	J. Stadfeld	419 California st
Silver Hill M Co	Nevada	21	15	Jan 9	Feb 13	Mar 6	W E Dean	309 Montgomery st
Union Con M Co	Nevada	23	50	Nov 5	Dec 30	Jan 19	J M Buffington	309 California st
Utah S M Co	Nevada	52	50	Dec 19	Jan 26	Feb 14	G C Pratt	309 Montgomery st
Virginia Creek Gravel Co	California	1	20	Dec 20	Jan 25	Mar 2	J M Quay	406 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Crocker M Co	Arizona	Aug Waterman	309 Montgomery st	Annual	Jan 19
Head Center Con M Co	Arizona	J W Pew	310 Pine st	Annual	Jan 22
Kossuth M Co		C K Sturtevant	328 Montgomery st	Annual	Jan 18

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	B L Burling	328 Montgomery st	50	Dec 5
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Dec 15
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Oct 8
Jackson M Co	California	D C Bates	309 Montgomery st	10	Dec 27
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Jan 13
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Nov 28
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Jan 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Nov 6

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE. Jan 7-Jan 14	Portland. Rain.	Temp.	Wind.	Weather.	Red Bluff. Rain.	Temp.	Wind.	Weather.	Sacramento. Rain.	Temp.	Wind.	Weather.	S. Francisco. Rain.	Temp.	Wind.	Weather.	Los Angeles. Rain.	Temp.	Wind.	Weather.	San Diego. Rain.	Temp.	Wind.	Weather.
Thursday	.38	38	W	Fr.	.03	56	N	Cl.	.00	50	NW	Cl.	.06	53	NE	Gy.	.00	61	SW	Fr.	.00	59	W	Cl.
Friday	.00	42	W	Fr.	.00	48	NW	Cy.	.00	49	SE	Cy.	.00	51	NW	Cy.	.00	61	E	Cy.	.00	64	E	Cy.
Saturday	.25	38	N	Cy.	.63	49	NW	LR.	1.10	56	SE	Fr.	.97	56	SE	LR	.66	63	W	Cy.	.10	62	S	Cy.
Sunday	.00	34	—	Cy.	.13	50	N	Cl.	.23	51	S W	Cl.	.34	52	NW	Cy.	38	59	SE	Cy.	—	—	—	—
Monday	.00	31	—	Cl.	.00	46	N	Fr.	.00	47	N	Cl.	.00	50	NE	Cy.	—	59	SE	Cy.	—	—	—	—
Tuesday	.03	34	W	Cy.	.30	45	N	Cy.	.46	45	NW	LR.	.47	50	N	Cy.	.00	61	SE	Cl.	.00	59	W	Cl.
Wednesday	.00	33	W	Cy.	.00	52	N	Cl.	.04	45	NW	Cl.	.00	43	N	Fr.	.00	61	S	Cl.	.00	60	W	Fr.
Totals	.66				1.09				1.63				1.84				1.04				.10			

EXPLANATION.—Cl. for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature wind and weather at 11:58 A. M. (San Francisco mean time), with amount of rainfall in the preceding 24 hours

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Dec. 23.		WEEK ENDING Dec. 31.		WEEK ENDING Jan. 8.		WEEK ENDING Jan. 15.	
Alpha	....	....	....	.65	.70	.80	.46	.50
Alta	....	.20	.10	.15	.05	.30	....	.30
Andes	....	.15	.15	.20	.10	.15	....	....
Argenta	....	....	....	....	.05	....	....	....
Belcher	....	....	....	.60	.65	.70	.65	.80
Belding	....	....	....	....	....	....	....	....
Best & Belcher	.80	1.50	1.30	1.45	1.10	1.35	1.10	1.25
Bullion	....	.25	....	.25	.20	.25	....	.25
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	.15	.20	....	.20	....	.15	....	....
Bodie Con	1.95	2.09	1.90	2.10	1.95	2.10	1.95	2.10
Benton	....	.10	....	.10	.05	.65	....	.05
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	....	....	.20	.50	.25	.35	....	.25
California	.35	.40	.35	.40	.25	.35	....	.30
Challenge	....	....	....	....	....	.25	....	....
Champion	....	....	....	....	....	....	....	....
Chollar	2.50	2.75	2.40	2.70	1.70	2.15	1.75	1.95
Confidence	....	.75	....	.75	.85	.90	.75	.90
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.35	.40	.35	.40	.25	.35	....	.30
Con. Pacific	....	1.10	....	1.10	....	1.10	1.00	1.15
Crown Point	....	....	....	....	.75	.95	.80	.90
Day	....	....	....	....	....	....	....	....
Eureka Con	....	....	1.25	1.80	....	1.15	1.15	2.00
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	....	.15	....	.15	.65	.15	....	.65
Grand Prize	....	....	....	....	....	....	....	....
Gould & Curry	1.10	1.25	1.10	1.30	95	1.15	1.00	1.20
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	2.80	4.15	3.65	4.10	3.40	3.75	3.60	5.00
Holmes	4.25	4.30	4.50	5.00	4.55	4.80	....	4.75
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	....	....	.15	.20	....	....	....	.16
Martin White	....	....	.35	.40	....	.35	....	....
Mono	4.15	4.40	1.30	1.55	1.25	1.80	1.25	1.55
Mexican	.70	.75	.65	.75	.50	.55	.40	.55
Mt. Diablo	....	....	3.70	3.75	....	....	3.50	3.60
Northern Belle	....	....	....	....	....	....	....	....
Navajo	1.90	1.95	1.90	2.05	1.85	2.05	1.75	2.00
North Belle Isle	....	....	....	.20	.15	.20	....	.15
Occidental	....	.75	....	.75	.75	.85	.90	1.00
Ophir	.65	.70	.65	.70	.80	.65	.40	.55
Overman	....	....	....	....	....	.10	.05	.10
Potosi	.80	1.00	.80	1.00	.65	.80	.70	.90
Pinal Con	....	....	....	....	....	....	....	....
Savage	1.25	1.70	1.60	1.80	1.60	1.80	1.80	2.00
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	.75	.85	.70	.80	.60	.75	.50	.65
Silver Hill	....	....	....	....	....	....	....	....
Silver King	....	....	....	....	....	....	4.60	6.00
Scorpion	....	.05	....	.10	.05	.15	....	.10
Syndicate	....	.35	....	....	....	.30	....	.40
Toga	....	....	....	....	....	....	....	....
Union Con	.65	.70	.55	.70	.50	.60	.50	.65
Utah	.35	.45	.15	.40	.15	.20	.15	.50
Yellow Jacket	....	1.60	1.00	1.15	1.20	1.60	1.20	1.25
	....	....	....	....	....	....	....	....

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

THERE is a project on foot to establish an insane asylum at Los Angeles.

Sales at San Francisco Stock Exchange.

THURSDAY A. M., JAN. 15.

100	Bodie Con	2.05	
50	B. & Belcher	1.20	
140	Chollar	1.95	
300	Con Va & Cal	.30c	
150	Eureka Con	.15@2.25	
600	Hale & Nor	.5.00@5.1	
100	Holmes	4.75	
300	Mexican	.50c	
300	Mono	1.45	
100	Navajo	1.80	
150	Ophir	.45c	
50	Potosi	.80c	
250	Sierra Nevada	.60@65c	
400	Savage	2.00	
400	Scorpion	.10c	
2000	Union Con	.55c	
100	Yellow Jacket	1.30	
AFTERNOON SESSION.			
170	Bodie	2.05	
250	Belcher	.70c	
230	B. & Belcher	1.20@1.25	
130	Chollar	1.95	
200	Crown Point	.90c	
30	Confidence	.75c	
500	Con Va & Cal	.30c	
30	Eureka Con	2.00	
200	Exchequer	.05c	
850	Gould & Curry	1.15	
100	Goodshaw	.60c	
350	Hale & Nor	4.85@4.90	
600	Mono	1.40	
150	Mexican	.45@50c	
100	N. Belle Is	.20c	
60	Navajo	1.80	
50	Ophir	.50c	
410	Sierra Nevada	.65@70c	
700	Savage	1.95@2.00	
50	Utah	.15c	
90	Union	.60c	

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Jan. 15, 1885.

ANTIMONY—Per pound		—	@ —
Hallet's		12½	@ —
Cookson's		13	@ —
BORAX—Refined		7½	@ 8
IRON—Glengarnock ton		23 00	@ —
Eglinton, ton		22 00	@ —
American Soft, ton		21 00	@ —
Oregon Pig, ton			@ —
Clipper Gap, Nos. 1 to 4		25 00	@ 30 00
Clay Lane White		26 00	@ —
Shotts, No. 1		26 00	@ —
Refined Bar		3	@ 4
Boiler, 1 to 4		5 00	@ 5 50
STEEL—English, lb		16	@ 25
Black Diamond, ordinary sizes		13	@ —
Plow		6	@ 8
Machinery		10	@ 12
COPPER—			
Braziers' sizes		—	@ 25
Fire-box sheets		28	@ —
Bolt		22	@ —
Yellow Metal		14	@ 15
LEAD—Pig		3½	@ 3¾
Bar		6	@ —
Pipe		7	@ —
Sheet		8	@ —
Shot, discount 10% on 500 bag	Drop, ₱ bag.	1 85	@ —
Buck, ₱ bag		2 06	@ —
Chilled, do		2 25	@ —
TINPLATE—O'dcastle		5 25	@ 6 00
Charcoal		5 75	@ 6 75
Coke		6 25	@ 6 50
Roofing		6 25	@13 50
ZINC—German		9	@ 10
Sheet, 7x3 ft, 7 to 10 lb, less the cask		9	@ 10
QUICKSILVER—By the flask		32 50	@33 00
Flasks, new		1 05	@ —
Flasks, old		85	@ —
NEW YORK PRICES—			
California Borax, refined		8	@ 9
Pig Iron, American No. 1		18 50	@19 00
Pig Iron, American No. 2		17 00	@17 50
Quicksilver		48	@ 50
Lead		3 50	@ 3 67½
Copper		11	@ 11½
Bar Silver		1 06	@ —

THE syndicate formed to organize an American exhibition in London, which will be opened in May 1886, has been merged into a private company with $500,000 capital. Lord Ronald Gower, who recently visited America, is chairman of the new convention.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & CO.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING JANUARY 6, 1885.

310,244.—TYPE WRITING MACHINE—E. S. Belden, S. F.

310,261.—FEED RACK—W. S. Downing, Half Moon Bay, Cal.

310,397.—CLUTCH FOR CABLE R. R.—N. A. Fisher, Sacramento, Cal.

310,268.—CAN FILLING MACHINE—J. J. Gorman, Temescal, Cal.

310,274.—COUPLING HOOK AND LOOPS—Harris & Baltzly, Hill's Ferry, Cal.

310,296.—MORTAR BED FOR STAMP BATTERIES—Massu & Fernandez, Mazatlan, Mexico.

310,310.—CUT OFF VALVE GEAR—John B. Pitchford, S. F.

310,316.—HARVESTER—Jas. W. Reams, Suisun, Cal.

310,231.—HORSE SHOE NAIL—J. C. Simpson, Oakland, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

TYPE WRITING MACHINE.—Edwin S. Belden, S. F. No. 310,244. Dated Jan. 6, 1884. This improvement in type-writers consists in a combination of devices. The object is to give as much room or space to each letter or character as it requires approximately, and not have each letter have a certain space, as now, without regard to the size of letter.

HARVESTER.—James W. Reams, Napa. No. 310,316. Dated Jan. 6, 1885. This patent covers improvements in headers, and the improvements have for their object the lightening of labor of both man and beast, by reason of the best means for effectively operating the machine with the least exercise of power. They consist generally, of various mechanisms and arrangements of parts, having in view the operation of the cutter or knife, and the handling of the machine.

FEED RACK AND MANGER.—Wm. S. Downing, Half Moon Bay, San Mateo Co.; assignor of one-half to Geo. H. Walker, S. F. No. 310,261. Dated Jan. 6, 1885. This combined feed rack and manger consists in a peculiar construction and arrangement of devices. The feed rack and manger has corner-posts, with cross-pieces at top and bottom, a floor, with strips fastened to it, upwardly flaring slats, secured to cross-pieces and strips, and a siding having a flaring top or rim.

LOCK.—George W. Roberts, Walla Walla, W. T. No. 310,084. Dated December 30, 1884. This invention relates to a new door-lock. It consists in a peculiar casing, having separate boxes or compartments, in one of which is contained a novel latch mechanism, said casing being let into the door and having flanges which overlap the adjacent edges of the door on both sides, and ears by which it can be secured. The object is to provide a strong and well-secured lock, having simple and effective mechanism.

COUPLING HOOK AND LOOP.—Chas. P. Harris and Stephen Baltzly, Hill's Ferry, Stanislaus Co., Cal., No. 310,274. Dated Jan. 6, 1885. This coupling hook and loop consists in a bar, having a hook at each end and a loop at each side. A spring guard spans the space between the adjacent ends of the hooks, to prevent any interference with them. The object is to provide a simple and effective device for general coupling purposes, but especially for use in coupling together the fifth-chains and stretcher-chains by which teams of mules or horses are hitched together for heavy hauling.

CUT-OFF VALVE GEAR.—John B. Pitchford, assignor of one-half to W. T. Garratt, S. F. No. 310,310. Dated Jan. 6, 1885. This relates to mechanism by which steam may be cut off after the valve has been opened to admit it to an engine cylinder, and the speed of the engine regulated to suit the work to be done. It consists of an equalizing arm or lever, which is so connected with the valve-stem of an engine that movement can be imparted to the valve from two different sources at the same or at different times, as may be required, for the purpose of opening and closing the valves and admitting and cutting off steam to suit the load of the engine. The invention is specially applicable to the independent, double-ported steam-valves of the Corliss type, as the movement required is much less than with a slide-valve, and the cut-off can take place in one valve at any time without affecting the valve at the other end of the cylinder. When used with a single slide-valve it is less effective, for the reason that it requires too great a travel of the valve, and consequently a large movement of the cam, and there is also a tendency to choke the exhaust passage.

Market Reports.

Lumber at Wholeeale.

The market has been moderately active, though receipts have been light of late. Quotations of cargo rates are as follows for redwood lumber, for delivery at San Francisco, Oakland, Alameda, Berkeley, Vallejo, Benicia, Port Costa, Martinez and Antioch:

ROUGH—No. 1 rough merchantable, $18; No. 2 (refuse) rough, $14; No. 1 rough boards (specified width, 10 inches and over), $10; No. 2 (refuse) do do do, $14; No. 1 rough lumber, surface one side, $21; No. 2 (refuse) do do do $18.

PICKETS—Rough square pickets, $12; rough pointed do, $14; fancy pointed do, $22.

HALF INCH LUMBER—No. 1 ½ inch surfaced, board measure, $40; No. 2 do do do, $39; No. 3 do do do, $38; No. 4 (refuse) do do do, $32; No. 1 ½-inch battens, board measure, $40; No. 2 (refuse) do do do, $32; No. 1 ½-inch siding, 12 ft and over, b m, $40; No. 2 (refuse) do do do $32; ½-inch siding, under 12 ft, $32.

RUSTIC—No. 1 Rustic, 1x10, 12 ft and over, $33; No. 2 do do do, $32; No. 3 do do do, $31; No. 4 Rustic, 1x10, $28; No. 5 (refuse) do do do, $21; No. 1 Rustic, 1x8, 12 ft and over, $31; No. 2 do do do, $30; No. 3 do do do, $29; No. 4 Rustic, 1x8, $26; No. 5 (refuse) do do do, $21.

CLEAR—No. 1 surfaced and rough clear, $32; No. 2 do do do, $31; No. 3 do do do, $30; No. 4 (refuse) do do do, $24; No. 1 surfaced and rough clear, 1x8 and 1x6, $30; No. 2, do do do, $29; No. 3 do do do, $28; No. 4 (refuse) do do do, $24.

[Dimensioned, Surface l and Rough Clear (widths and lengths), 12 inches wide and over, add $1 ₱ M (on each corresponding grade) to the above list price of "Clear."]

TONGUED AND GROOVED—No. 1 T and G, 1x4, 12 feet and over, $32; No. 2 (refuse) do do do, $24; No. 1 T and G, 1x6, 12 ft and over, $30; No. 2 (refuse) do do do, $24; T and G, 1x6, 7 to 11 ft, $26; do do, under 7 ft, $23.

TONGUED, GROOVED AND BEADED—No. 1 T, G and Beaded, 1x4, 1¼x4 and 1¼x6, 12 ft and over, $32; No. 2 (refuse) do do do, $24; T, G and Beaded, 1x4, 1¼x4 and 1x6, 7 to 11 ft, $27; do do, under 7 ft, $22.

ROUGH CLEAR—1x6 and under in width, and under 12 ft in length, $24.

[On a credit of 60 days, or a discount at the rate of 1 per cent per month for anticipated payments, and not less than 1 per cent per month added for extension of the same].

We quote cargo rates—Pine—Merchantable Rough, $15 ₱ M; Flooring, $24 20; Stepping, $37 ₱ M; Redwood—Merchantable Rough, $18; Surfaced, $32; Rough Clear, $32; Rustic, $33; Tongued and Grooved, $30; Tongued, Grooved and Beaded, $32.

Lumber at Retail.

Retail quotations for pine, fir and spruce are as follows:

ROUGH MERCHANTABLE—(Ordinary sizes) to 40 feet long, per M ft, $22.50; Rough Merchantable, 1x6, Fencing, $22.50; do do, 1x4, do, $23.50; do do, 1x3, do, $24.50; do do, 1x4, odd lengths, $22.50; do do, 1x6, do $21.50; do No. 2, all sizes, $18.50; do Selected, $26.50; do Clear, other than for T and G and Stepping, $31.

[Rough Clear for T and G and Stepping $1 ₱ M less than price of kind for which intended.]

Dressed T and G Flooring, 1x6, No. 1, vertical grain, ₱ M ft, $38.50; Dressed T and G Flooring, 1x6, No. 1, $33.50; do do do, No. 2, $28.50; Dressed T and G Flooring, 1x3, 1x4, 1¼x4 and over, No. 1, vertical grain, $40.50; do do do, No. 1, $35.50; do do do, No. 2, $29.50; Dressed Stepping, No. 1, vertical grain, $42.50; do do do, No. 1, $37.50; do do, No. 2, $28.50.

SPRUCE—Rough Merchantable, ₱ M ft, $21.50; do Clear, $35; Clear Dressed (shelving), $40; Pickets (rough) board measure, $20.50; Furring, 1x2, per lineal ft, 1c; Laths, 1 and 1-½inch, ₱ M, $3.50; 1½-inch, $4.

[N. B.—For all sizes over 14 inches, and lengths over 40 feet, extra rates].

Retail quotations of Redwood are as follows:

ROUGH MERCHANTABLE—₱ M ft, $22.50; do Selected, $27.50; do No. 2, $18.50; Surface, No. 1 and Rough Clear, $40; do, 1x8, $37.50; do, No. 2, $30; Rustic, No. 1, 1x8, $37.50; do, No. 1, 1x10, $40; do, No. 2, $35; do, under 10ft, $35; T and G Redwood, 1x4, 1¼x4 and 1¼x6, $40; do do, 6-inch, 12 ft and over, $37.50; do do do, 7 to 11 ft, $32.5; do do do, under 7 ft, $30; do do do, No. 2, $30; do do, Beaded, 12 ft and over, $40; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; Half-inch Surface, $32.50; Pickets, Fancy, $30; do, Rough, pointed, $20; do do, square, $17.50; Siding, ½-inch, $27.50; Battens, ½-inch, per lineal ft, 1c; Shingles, ₱ M, $2.50; Shakes, Split, $11; do, Sawed, $12; Posts, per piece, 13c; Dressed Boards, ₱ M ft, $25.

On a credit of 60 days or less, or a discount of two (2) per cent for cash only. On all credits exceeding 60 days' time, not less than one(1)per cent per month to be added.

Under the rules of the Exchange, no "lump" sum will be given on any bill of lumber.

Nails.

We give the price list of the Pacific Iron and Nail Company.

FENCE AND BRAD.—10d to 60d, $2.75: 8d and 9d, $3.00; 6d and 7d, $3.25 4d and 5d, $3.50; 3d, $4.25; 2d, $5.50.

BARRELS.—¾ inch, $6.75; ⅞ inch, $5.75; 1 inch, $5.25; 1¼ inch, $4.50; 1½ inch, $4.25; 1¾ inch, $3.75; 1½ inch, $3.50.

LINING.—¾ inch, $7.25; ⅞ inch, $8.75.

TOBACCO.—10d, $3.25 8d, $3.50; 6d to 7d, $3.75.

CLINCH.—6d to 30d, $4.50.

SLATING.—5d, $3.75; 4d, $3.75; 3d, $4.50; 2d, $5.75.

FINISHING.—2d, 1 inch, $8.75; 3d, 1¼ inch, $6.75; 4d, 1½ to 1¾ inch, $4.50; 6d, 2 inch, $4.25; 8d, 2½ inch, $4.00; 10d, in ch and over, $3.75.

CASING AND BOX.—10d to 30d, $3.50; 8d, $3.75; 6d, $8.00; 4d, $4.25; 3d, $5.25.

FINE BLUED.—4d, $4.50; 3d, $5.75; 2d, $6.50.

CUT SPIKES.—All sizes, $3.00.

BOAT SPIKES.—All sizes, $3.50.

Each half keg 10 cents extra.

TERMS.—Note or acceptance at 60 days with current rate of Exchange on S. F., or a discount of 2 per cent for cash, if remitted within 10 days from date of invoice.

All accounts when due subject to sight draft without notice.

An abatement of 10 cents per keg will be allowed upon orders of 200 kegs or over.

Building Materlal.

Lime, per barrel, $1.50@$1.60. Plaster, $2.75–3.00. Eastern Plaster, $3.00–3.25. Rosendale Cement, $2.25–2.75. Portland Cement, $3.50–3.75. Fire Brick, per 1,000, $40 @ $45, according to brand; hard, $10.00@$12,00; red, $8.00@$8.50; soft, $7.50; face, $30.00.

IN starting up the new hydraulic pump on the Comstock this week, it was no small job to make everything perfect, even after all connections were made. Thus, in filling the supply pipes, as the water was turned in, workmen began at the bottom and tightened every joint, where there was even the smallest leak, tamping with metal every cbink and hole, though some were not larger than the smallest needle.

THE difficulty between the employes and management of the Old Dominion Copper Co., Arizona, has been settled. Miners are to receive $3.50, and surface men, $3 per day.

A LEADING business firm in Salt Lake City recently purchased for $50,000, an interest in the gold-bearing gravel mines of Godbe & Co., at Osceola, Novada.

Dewey & Co., American and Foreign Patent Agents.

PATENTS obtained promptly; Caveats filed expeditiously; Patent Reissnes taken out; Assignments made and recorded in legal form; Copies of Patents and Assignments procured; Examinations of Patents made here aud at Washington; Examinations made of Assignments recorded in Washington; Examinatioos ordered and reported hy Telegraph; Rejected cases taken up and Patents obtained; Interferences Prosecuted; Opinions rendered regarding the validity of Patents and Assignments; Every legitimate hranch of Patent Soliciting promptly and thoroughly conducted.

Our intimate knowledge of the varions inventions of this coast, and long practice in patent business, enable us to abundantly satisfy our patrons; and our success and business are constantly increasing.

The shrewdest and most experienced Iuventors are found among our most steadfast friends and patrons, who fully apprcciate our advantages in bringing valuable inventions to the notice of the public through the columns of our widely circulated, first-class journals—thereby facilitating their introdnction, sale and popularity.

Foreign Patents.

In addition to American Patents, we secure, with the assistance of co-operative agents, claims in all foreign countries which graut Patents, including Great Britain, France, Belgium, Prussia, Austria, Baden, Peru, Russia, Spain, Britisb India, Saxony, British Colnmbia, Canada, Norway, Sweden, Mexico, Victoria, Brazil, Bavaria, Holland, Denmark, Italy, Portugal, Cuba, Roman States, Wurtemburg, New Zealand, New South Wales, Queensland, Tasmania, Brazil, New Granada, Chile, Argentine Republic, AND EVERY COUNTRY IN THE WORLD where Patents are obtainable.

No models are required in European conntries, but the drawings and specifications should be prepared with thoroughness, by able persons who are familiar with the requirements and cbanges of foreign patent laws—agents wbo are reliable and thoroughly established.

Our schedule price for obtaining foreign patents, in all cases, will always be as low, and in some instances lower, than tbose of any other responsible agency.

We *can and do* get foreign patents for inventors in the Pacific States from two to six months (according to the location of tbe country) SOONER than other agents.

The principal portion of the patent business of tbis coast bas been done, and is still being donc, through our agency. We are familiar with, and have full records, of all former cases, and can more correctly judge of the value and patentability of most invcntions discovered here than any othcr agents.

Situated so remote from the seat of Government, delays are even more dangerous to the inventors of the Pacific Coast than to applicants in the Eastern States. Valuable patents may be lost by extra time consumed in transmitting specifications from Eastern agencies back to this coast for the signature of the inventor.

Confidential.

We take great pains to prcserve aecrecy in all confidential matters, and applicants for patents can rest assured that tbeir communications and business transactions will be held strictly confidential by us. Circulars of information to inventors, free.

Home Counsel.

Our long experience in obtaining patents for Inventors on this Coast bas familiarized us with the character of most of the inventions already patented; hence we are frequently able to save our patrons the cost of a fruitless application by pointing to them the same thing already covered by a patent. We are always free to advise applicants of any knowledge we bave of previous applicants which will interfere witb tbeir obtaining a patent.

We invite tbe acqnaintance of all parties connected with inventions and patent right business, believing that the mutual conference of legitimate business and professional men is mntual gain. Parties in douht in regard to their rights as assignees of patents or purchasers of patented articles, can often receive advice of importance to tbem from a short call at our office.

Remittances of money, made by individual Inventors to the Government, sometimes miscarry, and it bas repeatedly bappened tbat applicants have not only lost tbeir money, but their invontions also, from this cause and consequent delay. We hold ourselves responsible for all fees intrusted to our agenoy.

Engravings.

We bave superior artists in our employ, and all facilities for producing fine and satisfactory illustrations of inventions and machinery, for newspaper, book, circular and otber printed illustrations, and are always ready to assist patrons in bringing their valuable discoveries into practical and profitable use.

DEWEY & CO.,

United States and Foreign Patent Agents, publishers Mining and Scientific Press and Pacific Rural Press, 252 Market Street. Elevator, 12 Front St., S. F.

The World's Industrial and Cotton Centennial Exposition

Will be open for Six Months, beginning 16th day of December, 1884.

The display will embrace such a varied and comprehensive collection of the works of nature and art as it is possible for human enterprise to gather.

From the applications already received and entries made, the magnitude of the oxhibit will exceed that of any Exposition ever held.

The exhibits of the Departments of the General Government, for which $300,000 was appropriated by Congress, will be the largest and most complete ever made. These exhibits, in conjunction with the State and Territorial Collective Exhibits and Educational display, will occupy the full space of the second largest building of the Exposition—one of the very largest ever erected—885 feet by 565 feet.

The displays in the Horticultural department, in Agriculture and in the Live Stock department, will be of qual, if not greater, magnitude than if separate and distinctive exhibitions were given.

The Mexican and Central American Exhibits will possess unusual interest from their variety, uniqueness and historical value.

In the line of Manufactures and Arts, and in natural products, the Exposition will be memorable—excelling all previous efforts.

The principal structures of the Exposition are:

The Main Building—1,378x005 feet—the largest ever erected. To Machinery Hall, which forms a portion of the Main Building, and is 1,378 feet long by 300 feet wide, an extension of 350x120 feet has been added for the special uses of Factories and Mills' Machinery, making Machinery Hall 1,728 feet long by a width of 300 feet—nearly its whole length.

The U. S. and State Exhibits, 885x565 feet.

The Horticultural Hall, 600 feet long by 194 feet wide, in center.

The Art Gallery, 250x100 feet.

The Mexican National Exhibit, Octagonal, 80 feet cross section.

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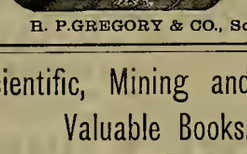

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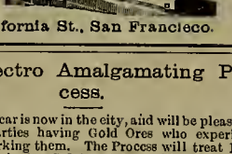

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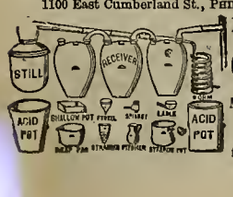

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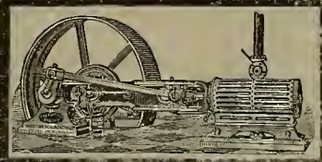
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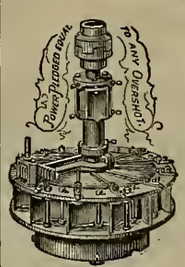

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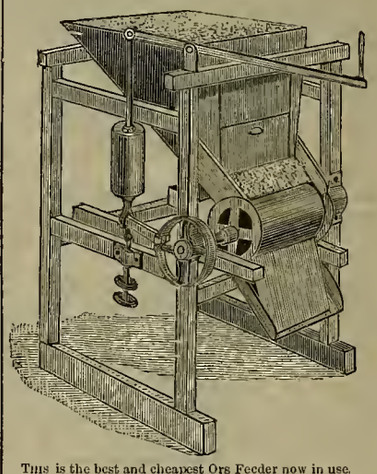
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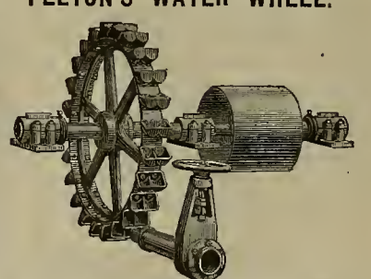
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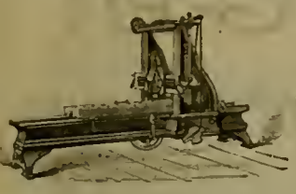

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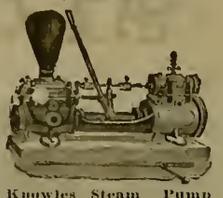

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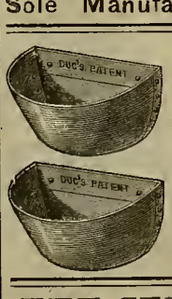

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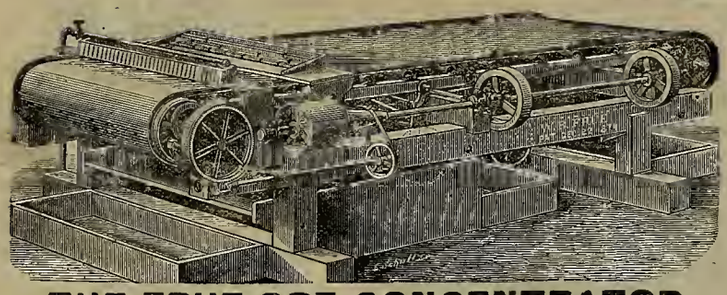

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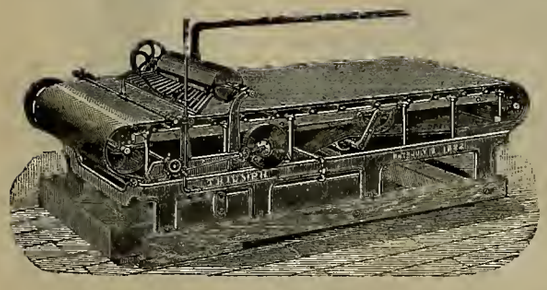

THE
"TRIUMPH" ORE CONCENTRATOR.

PRICE, FIVE HUNDRED AND FIFTY DOLLARS ($550.00), F. O. B.

THE "TRIUMPH" TRIUMPHANT!

In a competitive trial recently had between two of the "Triumph" Ore Concentrators and the same number of "Frue' Vanning Machines, at the mill of the celebrated gold producing Original Empire Mill and Mining Company, in Grass Valley, Nevada County, Cal., the "Triumphs" produced thirteen and fifteen one-hundredths (13.15) per cent more concentrations than did the "Frue" Vanners, during a run of twenty-four consecutive days, or a net gold coin result of $199.15, or $8.30 per day, in favor of the two "Triumph" Concentrators.

These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with accurate deductions therefrom, will soon be published in Circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and we hereby accept the Challenge of $1,000, flaunted by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

We guarantee purchasers against all costs, expenses or charges incurred by reason of any infringements of any existing patents.

"Put up or shut up," and "Let the Best Machine win!"

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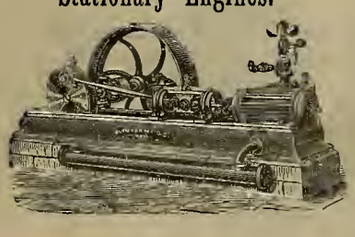
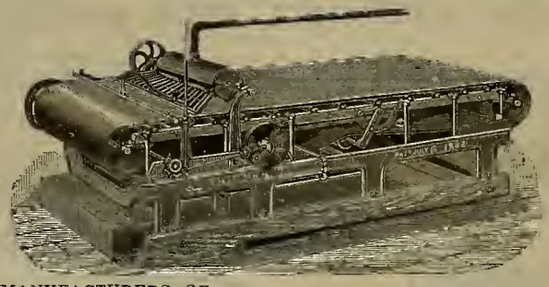
DEALERS IN NEW AND SECOND-HAND BOILERS, ENGINES, AND MACHINERY OF EVERY VARIETY.

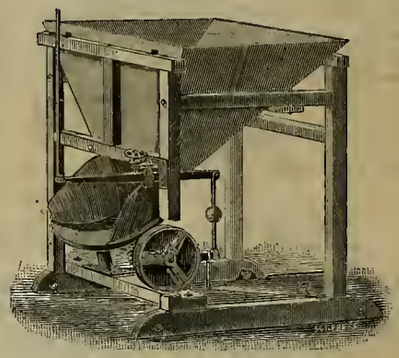
TRIUMPH CONCENTRATORS.

Stationary Engines.





"Challenge" Ore Feeders.



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BAKER ROTARY PRESSURE BLOWERS, WILBRAHAM ROTARY PISTON PUMPS,
HOT POLISHED SHAFTING, and P. BLAISDELL & CO.'S MACHINISTS' TOOLS.

INTEREST IN A QUARTZ MINE.

I am prepared to give any responsible parties a good interest in my Quartz Lead, who will sink a shaft one hundred or more feet deep, or run a tunnel on said lead of one hundred or two hundred feet in length. The lead joins the rich gold quartz mine of Senator John P. Jones, W. A. Nevills, and others. It is situated three miles south of Jackson, Amador county, Cal., and near Middle Bar on the Mokelumne River. I believe that the shaft or tunnel will develop gold-bearing material the same as has been found in adjoining mines. The Mammoth found rich rock at 100 feet from the grass roots. From one blast in that mine they took out $75,000 to $100,000. This is a good opportunity for any one to go into a legitimate mining enterprise of merit. Call upon or address

A. CHAMBERS,
Jackson, Amador Co., Cal.

HEALD'S BUSINESS COLLEGE, 24 Post St. S. F. Send for Circular.

COKE. PATENT COKE.

This COKE is exclusively used by Prof. Thomas Price, in his assay office, by the Selby Smelting and Lead Company, Union Iron Works, Risdon Iron and Locomotive Works, and others in this city. Large supplies are regularly forwarded to consumers in Salt Lake and Nevada, to the Detroit Copper Company, United Verde Copper Company, Old Dominion Mine, and other consumers in Arizona.

The undersigned are in receipt of regular supplies from Cardiff, Wales, and offer the COKE for sale in quantities to suit purchasers.

BALFOUR, GUTHRIE & CO.,
316 California St., San Francisco.

DIVIDEND NOTICE.

Plymouth Consolidated Gold Mining Company, No. 23 Nassau street, New York Jan. 5, 1885. DIVIDEND No. 20.—The Board of Trustees of this Company have this day declared the regular monthly dividend of fifty thousand dollars, being one per cent on the capital stock, or fifty cents per share, payable on January 9, 1885. W. VAN NORDEN, President.

California Inventors Should consult DEWEY & CO. AMERICAN AND FOREIGN PATENT SOLICITORS, for obtaining Patents and Caveats. Established in 1860. Their long experience as journalists and large practice as Patent attorneys enables them to offer Pacific Coast Inventors far better service than they can obtain elsewhere. Send for free circulars of information. Office of the MINING AND SCIENTIFIC PRESS and PACIFIC RURAL PRESS, No. 252 Market St., S. F. Elevator 12 Front St

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

ANNUAL MINING REVIEW—TWENTY-FOUR PAGES.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JANUARY 24, 1885.

VOLUME XLXX. Number 4.

Movable Point for Drill-Pump in Shaft Sinking.

Mr. James E. Mills, of Quincy, Plumas county, in the work of exploring certain gold-bearing grounds in the American Valley in that county, found it necessary to sink a shaft through loose materials, containing in some layers large quantities of water, and was compelled to devise a new method which has proved successful. The excavating was almost wholly done by a modification of the sand-pump used in working artesian wells, which hecalls the drill-pump. This drill-pump could not have a diameter near to that of the shaft, like the sand pump of artesian wells, nor could it extend across the shaft so as to be brought to bear on the whole area of the bottom hy being turned around. It was therefor hung from a movable point so that its position could be shifted, and it could be placed over and dropped on to any part of the bottom of the shaft.

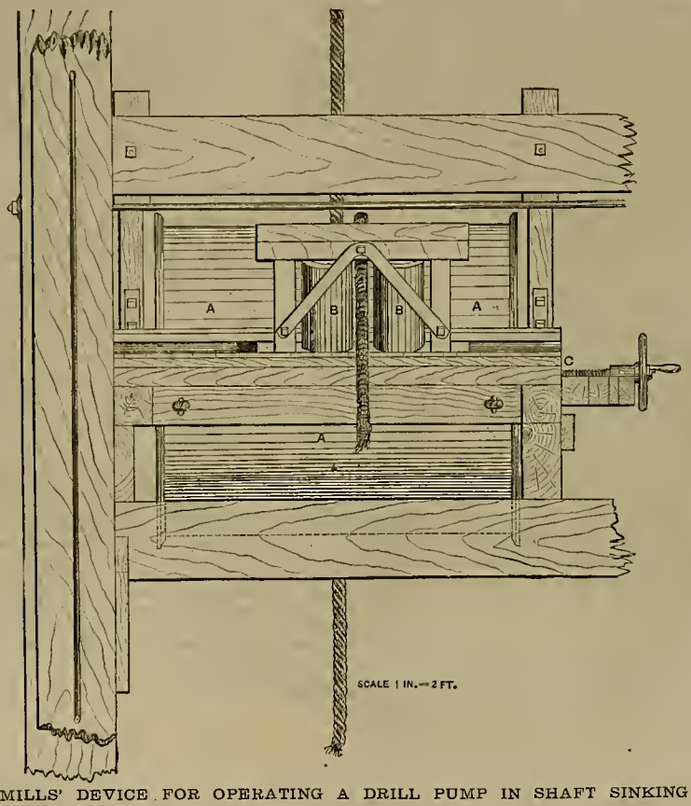
It is not our purpose on this occasion to describe the whole process of shaft sinking by Mr. Mill's method, which, however, it is our intention to do shortly. In this number of the PRESS we shall briefly describe the method of hanging the drill from the movable point.

This could hardly he accomplished with the walking beam ordinarily in use in artesian well boring, and the drill rope therefore, instead of being suspended from such a beam was connected through the clamp and temper-screw with another rope, which was attached by a loose wooden eye to the wrist pin of the gear wheel through which the drilling motion was imparted to the tools. Such a connecting rope is in common use in sinking small artesian wells by horse-power, but it passes over a sheave fixed in position.

This latter rope, on its way to the gear-wheel passed over a rolling horizontal drum A, shown in the engraving, and between two vertical rollers B. The drum could be moved foward by a winch, and run back by a weight, and the vertical rollers could be moved to right or left by a screw C, and so the point of suspension of the tools could be placed over any part of the flow of the shaft, where the drill pump was to work. The hoisting frame and machinery were the same as used for ordinary hoisting and pumping.

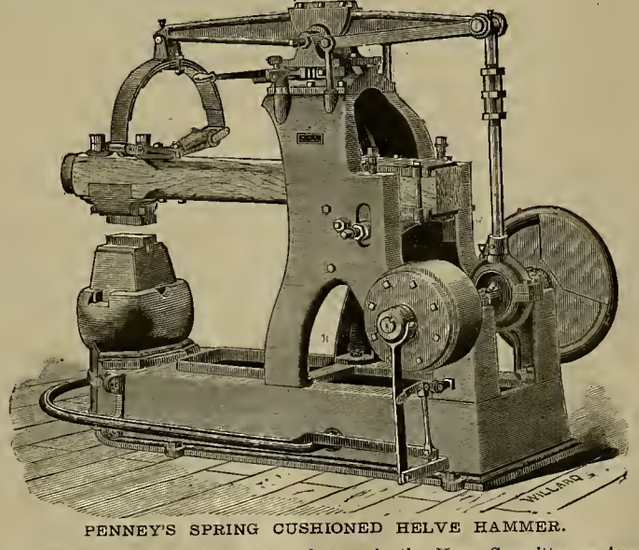
The tools were let down and the connecting rope attached by a clamp, and put into place by moving the drum and rollers, the main rope slackened above the clamp, and the machinery started, giving the lift-and-drop motion to the tools. When the drill pump was loaded, the connecting rope was unclamped from the main rope, and disconnected with its driving wheel by slipping the wooden eye from the wrist-pin, the drum moved back, the tools raised and the drill pump emptied.

SIMPSON'S COMPRESSION LUBRICATOR.—This is a sight drop luhricator for journals and hearings of all kinds. The engraving which appears in the advertisement in another column shows its appearance. Constant and regular lubricators is indispensable to the economical working of machinery. The claims for this luhricator are economy in use of oil, a guard against a hot journal, and a constant regular flow, drop by drop, which can be seen through the peek holes. It is so constructed that grease or oil can be used in it to great advantage because in works at any angle. The advantage claimed for this cup over other cups made for grease or compound is this: It is not necessary to wait for heat to move the grease, for that is a poor way of supplying the journal, from the fact that when the journal becomes hot enough to melt the grease in the cup it is too hot to retain it, and it runs off and leaves the journal without a lubricator, or the heat melts the grease around the rod and leaves the rest sticking to the sides of the cup; or the rod becomes stuck in the grease and don't touch the journal. The box and cup must become hot enough to start the grease before it will run down to the journal. It is considered a dangerous way to rely on heat to supply the journals with lubrication. This lubricator is provided with a valve in the shank that yields when the pressure is applied, and goes back to its place when the desired amount of grease has passed out. This lubricator is also made without the valve for hard grease, if desired.



MILLS' DEVICE FOR OPERATING A DRILL PUMP IN SHAFT SINKING

THE Indian Appropriation bill, as agreed upon by the House Committee on Appropriations, provides an appropriation of $5,664,136. The estimates amounted to $7,328,049. The appropriations made last session of Congress for the present fiscal year were $3,589,493.



PENNEY'S SPRING CUSHIONED HELVE HAMMER.

Penney's Cushioned Helve Hammer.

The hammer here illustrated is from new designs, and with several very important improvements. It is intended for the heaviest work, and to endure the abuse that such machines are subjected to. It is built entirely of iron and steel, with the exception of the helve; very strong and substantial, yet not cumbersome in working, but is easily handled, and for convenience of adjustment is unsurpassed. This machine has stood the test for years, and has never failed of giving satisfaction when fairly tested. It is still growing in favor as it becomes known to manufacturers, on account of its substantial make, quantity and quality of work, and facility of operation.

The helve is hung upon two adjustable hardened steel centers. It derives its motion from a broad eccentric on driving shaft, all perfectly fitted up so that they run almost entirely free from friction. The husk containing the helve, can be easily raised or lowered to admit of dies, varying an inch or more in thickness, without shimming them up. The anvil block and its foundation, are separate from the hammer proper, and the entire jar and concussion of the blow, is received on the anvil alone, relieving all other parts of the strain which they would otherwise sustain. The hammer head is cast steel, and is very long, in order to give good support to the helve.

The advantage of this hammer is the arrangement for changing the length of the stroke while the hammer is in motion, by a lever which changes the fulcrum of the beam on top of the hammer.

The speed is regulated by a gentle pressure on the treadle by the foot, which works a cone-shaped, paper friction running in the loose pulley. The speed is governed according to the pressure applied to the treadle, so that the hammer is completely under the control of the operator. They strike the most perfectly accurate, powerful and elastic blow that can be given. They are adapted to every kind of forging and they never get out of order. The Berry & Place Machine Co., 12 California St., in this city, are sole agents for this coast.

THE immigration by the Northern Pacific Railroad during 1884 was 13,263. This includes intending settlers in the East to points in Oregon and Washington Territory, west of Spokane Falls. The heaviest months were: March, 2,415; April, 2,468; May, 1,741. It is estimated that the immigration by steamer from California, and by team into Eastern and Southern Oregon is about equal to the above figures, making one year's immigration fully 25,000.

THE Union Pacific system consists of 4,748 miles of road under the full management of the company, and enough more in which the company has a controlling interest to bring the entire system up to 5,670 miles, making it the most extensive railway system in the hands of one company in America.

TIN.—We have secured several samples of tin ore, and a small bar of tin from the new Dakota mines, together with a description of the tin mining region, from Mr. Mark R. Hydliff, of Bear Gulch, D. T. We shall refer more fully to the subject next week.

DURING the last year 320,800 steerage passengers and 59,500 cabin passengers landed in New York city.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS

The Mineral Belt of Amador County.

EDITORS PRESS:—In the PRESS of Nov. 29th and Dec. 13th, 1884, I gave you and your legion of readers a description of the mineral belt of Amador county in general. I now continue this subject by giving you the separate or different mining claims, or some of them at least, in this southern portion of the county as they are to-day, and as I found each and every one of them when I visited them and their respective owners since my last article or communication. I will commence with the extreme southern mine at the bank of the Mokelumne river, and proceed in their regular order as they come, going north on this mineral belt at least as far as Jackson and the Zeile mines at that place. First comes

The Farrall Mine,

As it is called. This runs to the above river (Mokelumne) and is 1500 by 600 feet. The hill, or mountain, is a steep one, and a regular ascent for 1000 feet on the surface of the ground. There are two tunnels run into this claim of 100 feet, and 300 or more feet in length, two-thirds of the way up the hill. There are also upon the level or top of the hill some two or three shafts of from 60 to 100 feet each deep, in and from which good paying and milling quartz has been taken, some of which yet lays on the dumps. One of these shafts is a large double track incline following the ledge and timbered very nicely and most substantially with sawed square timber of about 8 by 10 or more inches square; the ledge is well defined and carries paying quartz rock about from the top of the ground. The general lay of the ground in this claim is perhaps one of the finest and best to be found along or upon this mineral belt, as the mountain is one unbroken hill from the river bank all the way up, and the finest site for mills on the river bank to be found anywhere; and as the Amador ditch or canal runs (when built to there) upon the very top or summit of this mountain, you have in this mine one of the finest and greatest of water powers to be found anywhere, being 800 to 1000 feet above the river. This mine has lain almost idle for some years, owing to litigation which is, or was a few months ago, settled in the courts, and Mr. James Farrall is with perhaps others, the owner and occupant of this Number One mine. There are upon this mine a good blacksmith shop, a cabin or two and a building over the shaft. I will say that Mr. Farrall, like most of the other owners, is unable (financially) to develop this, which evidently will be one of the best quartz mines in the county, when $100,000 is properly expended in mining and milling machinery on the property. The next quartz mine on the north is what is known as the

McKenny Quartz Mine.

This is 600 by 1,300 feet. There the ground over the claim is considerably broken up by being cut up with small ravines through it, and the lead is scattered over the ground for 100 or more feet in places, whereas in the Farrall mine, above mentioned, nothing of this kind occurs, it being one unbroken, solid hill or mountain of ground, with the lead undisturbed. Half a dozen shafts have been sunk from 50 to 100 and 200 feet deep, and considerable quartz also has been taken out by a number of open cuts and by washing by hydraulic and sluices in this mine for several years past. Some rich places have been struck in working the mine, from which $50,000 or more has been taken. An 8-stamp quartz mill was at one time built at the river, and several thousand tons of rock crushed, which paid from $5 to $10 per ton. This mill was afterwards increased to 16 stamps, and ran upon the rock from this and the Hardenburgh mine, half or three-quarters of a mile above this. The same "Amador canal" or ditch also runs along and above this mine. Here, also, when one or two hundred thousand dollars are properly expended in mining and milling machinery, will be found a rich mine. Mr. Abraham McKenny, the owner, lives at Middle Bar, and keeps a store and public house. Next, and north of the McKenny mine, is the

Marlett Quartz Mine.

This is also 600 by 1,500 feet, and the ground is not so much broken up by small ravines as the last named mine. There is a tunnel of 200 feet run into this mine, with a shaft of 75 feet deep from the bottom of this tunnel, from which this fall and in the past few months considerable gold has been taken. The character of this lead or mine is the same as the last named mine, the quartz lead being less scattered. The water at first stopped the working of this mine. The quartz in it is not taken from the main lead, but only from small spurs, some 8 to 12 inches wide, and most of this quartz was of that black arsenite and iron character that is in the Mammoth mine, north of it, which is the great "bonanza" lead or mine here. Mr. Marlett has pounded up most of this rich black gold-bearing matter in a hand mortar, though some tons of paying quartz rock lie on the dump at the tunnel, which is also the case at the McKonny mine, last noticed. This mine, like the other, when it is worked properly and with $100,000 or more spent for mining and milling machinery, must prove a "bonanza" to those owning it and working it. Mr. John Marlett, the principal owner, with Mr. Sargent, lives also at Middle Bar, but, like all the other owners, is unable to properly work it.

I will send you further notes next week.

WELLINGTON.

Blackburn Mining District, Idaho Territory.

EDITORS PRESS:—Several mines in the Blackburn District, near little Lost River, Idaho, are proving very valuable. The Tyndall lode shows a continuous outcrop of ore and quartz for over four miles in length, and on the following claims there is a good showing of high-grade ore, viz.: The Ingersoll, Tyndall, Alice, Great Northern, Daisy Black and Combination. Carbonate ore has also been found on the Dixie, Silver Queen and Carbonate Queen.

There has not been much work done on these mines, but the showing of ore is very good for what has been done. The ore in all these claims appears to be of similar character, viz., galena and carbonate of lead and black copper. These ores assay in silver all the way from 25 to 2,500 ounces per ton. There are many thousand tons of such ore now in sight. The veins are wide, long, and stand nearly vertical. The country rock-wall rock of these lodes or veins is "quartzite" exclusively. There are other claims north and east of the Tyndall lode that are in a limestone formation, but these veins contain less silver than the ores found in the quartzite.

The quartzite stands on end, or nearly vertical, and the ore bodies go down very regularly and prove better in metal as depth is attained. A shaft on the combination is over a hundred feet deep, showing a great cap of iron; but carbonate and galena is making its appearance at the bottom. The ore at the Ingersoll is all carbonates of lead, galena and copper ore—very rich in silver. One shaft is 75 feet deep in carbonate ore, and over a hundred feet of tunnelling shows the same kinds of ore, gray carbonate and galena. The Ingersoll is proving a genuine bonanza. The same can be said of the Daisy Black, Alice, Great Northern and Tyndall. These mines will produce a great deal of rich bullion when once properly worked. The camp is in great need of machinery, concentrators and a smelter. As soon as that is done it will require a railroad to move the bullion. When all the claims on the Tyndall Lode are fairly worked there will be a daily output of over "five hundred tons of lead-silver bullion." I say it can be done when fairly worked, and it can average that the year round. The ore is there and all that is needed is labor and machinery.

The climate of the Blackburn district is very mild, no deep snow, and never so cold as in those camps further north and of greater altitude. The Blackburn district includes a strip of country twenty-five miles long and about ten miles wide. It is on the west slope of the Carbonate Range, east of Little Lost River, Alturas Co., Idaho.

The soil at the sink of this river—Little Lost—is about like that around Boise City or Salt Lake City—very productive, and the finest vegetables and cereals grow and mature here as well as they do on the American bottom along the Mississippi. The Lost River region is destined to be a famous mining country in the near future. The lodes are large and most of the ore high grade—rich in silver. Mining operators can find no better place to take hold of good paying mines, than here. Properties can be had very reasonable, and many of them will pay a good dividend right from the start.

PROSPECTOR.

Tuolumne County Mining Interests.

EDITORS PRESS:—Although mining operations have been carried on very slowly during the past year, a great many new developments have been made, and the coming year will show a larger bullion product than for many years past. There is no county in the State of California where a good mine can be purchased on as easy terms and for so little money as in Tuolumne. To illustrate:

Johnnie Skae, of Sierra Nevada fame, came here scarcely a year ago for his health, more than with any intention of engaging in mining; but after a visit to the Buchanan mine was so favorably impressed with its prospects that he inquired the prices of undeveloped mines in that vicinity, expressing a wish to do a little prospecting. He was shown the Dead Horse mine by that genial-spirited and enterprising miner, Mr. John A. Davis. Mr. Sharwood, the owner of the Dead Horse, sold to Mr. Skae for $1,000. After ten months' work, the Dead Horse shows a 300-foot shaft with three levels run. All the rock taken out in running the levels has been hauled and milled, and shows the ore to average $25 a ton in free gold; the vein is over three feet thick. Mr. Quick, the gentlemanly superintendent, estimates that there is $125,000 in sight. The mine has so far paid its own way for all work done, and not one pound has been stoped.

The Buchanan Mining Company have struck their chute at a depth of 400 feet. They have a six-foot vein of $30 rock. The company will build a road as soon as the rains cease, and after hauling in their machinery will put up a 40-stamp mill.

A company unknown to the writer have bought a controlling interest in property owned by John Summers near Summersville, and will build a mill in the spring.

The Soulsby mine at Soulsbyville continues to hammer away. The mine has produced millions, is down over 800 feet, and its 20-stamp mill is kept steadily pounding away on forty dollar rock.

Long and Hampton's 10-stamp mill at Jacksonville is running on $4 rock. Their mine is on the great Mother lode. At a point where an enormous granite dyke intersects the vein there is a mass of material over seventy feet in width consisting of granite, quartz, slate and clay all mingled together. A pan taken anywhere from this mass shows quite a "tail" of heavy flour gold. It only costs one dollar a ton to mine and mill; two and a half tons are put through to the stamp. If it pays four dollars a ton it is a big thing, for there is enough to run 100 stamps for ten years already in sight. There are a dozen mines on the line of the Mother lode that prospect fully as well as this mine mentioned, which can be bought for a few thousand dollars per claim. If practical men with some money come here they can easily find good mines cheap and can make money in Tuolumne county; but inexperienced men, and men from the East, along with broken-down superintendents from Nevada, who never saw a gold mine, and who imagine that because they have succeeded in working silver mines, they can also work a gold mine without serving an apprenticeship, had better stay away; they are not wanted.

The Riverside mine and 20-stamp mill, near Columbia, will soon be started up under the management of that energetic, rattling miner, Jim Barrou, which means that it will be worked in style. The Alabama 48-stamp mill is running steadily. The Heslep mine, at Quartz Mountain, is running 20-stamps steadily on $9 rock. App & Co. have a 5-stamp mill running on good rock. Over 80 new stamp mills will be running in the county before summer is over. Pocket miners are all in good spirits. Sums ranging from $800 to $1,200 have been taken out near Sonora during the past month. It is reported the Mandich Bros. have taken out $30,000 during the past week from the Simouich claim, on Brown's Flat, which they are working on a lease. A piece of nearly pure gold, as large as an orange, was shown the writer, and said to have come from this "pocket." The piece bore the marks of a chisel, and is said to have been cut from a much larger chunk. E. L. Lang and W. R. Shaw are building a mill near Groveland. They have a continuous pay chute 1,200 feet long. Rock hauled to custom mill as a test paid $30 per ton.

Before another year, we will undoubtedly have direct communication by rail with San Francisco. At present all freight must be hauled on mule teams, 40 miles from Milton station. The Eagle mine, on the Mother lode, near Jacksonville, will soon be put in operation by Chas. W. Tozer. They had a 12-foot vein of $7 rock when the mine shut down over 20 years ago. In those days $7 rock was not considered profitable. Such things are being looked after at present. Abundant rain has fallen, and the mining outlook in Tuolumne county can be called very bright indeed.

MICKEY FREE.

Sonora, Tuolumne Co., Jan. 14, 1885.

Howells, Arizona.

EDITORS PRESS:—In No. 26, we read your request that the miners tell what they know about their camp. I have been a subscriber to your paper for over a year, and have often thought that it would be a good idea for miners to exchange ideas through the press. Big Bug, Lynx Creek and Turkey Creek districts have been almost at a standstill for the last year, yet there has been the usual amount of assessment work done. The Howell smelter has stood still, and there has been no incentive for the boys to get out ore, for there was no way to get it reduced to bullion. There is any amount of ore here that will run from $20 to $100 to the ton in gold and silver. We need the proper machinery to concentrate the ore, and this is a big field for capitalists to come in and put up suitable works. A good custom mill would have all it could do. This country is full of wood, water, timber and good low grade mines. We need a railroad. Freight is so high that it takes away all the profits, and our smelters are compelled to lie idle. Mr. Schofield and others are putting up a stamp mill and concentrators on Big Bug, and rumor has it that Mr. Whitcomb will put up another on Big Bug in the spring. Mr. Chase, of Pine Flat, Turkey creek district, put up two 10 stamp mills, and has gone East to get concentrators. The *Courier* informs us that the Mineral Belt Railroad will be built this year. Our Legislature meets on the 12th, and we are all waiting to see if they won't do something toward getting a railroad into Prescott. We have been snowed in all winter, so we are compelled to lie still, but hope that spring will open with a boom. The placer mines will have plenty of water this year. We are looking for a reduction in wages from $4 to $3 per day, and hope that board, provisions, transportation, etc., will come down also, and that miners, millmen and merchants will go in on the "live and let live" principle, and make 1885 a year of success for all.

A MINER.

Cottonwood District.

EDITORS PRESS:—In compliance with your request for mining facts for your "annual review," I send you a line on our Cottonwood District.

This camp is situated about 90 miles northeast of Reno, Nev., north of Pyramid lake, on the line between Washoe and Humboldt counties. It has been known for years that there was rich ore in the district, but no developments were made until about three years ago, and now there is not an incline or shaft 100 feet deep. There are a number of locations more or less prospected. The following are among the most promising: The Hornet, owned by Dr. F. R. Waggoner, and others of Reno, with an incline 85 feet, showing a three-foot vein for the full depth, carrying tetrahedrite ore giving high assays, from $100 to $2000, the whole fissure being a high milling proposition, mineral increasing with the ore in depth. Susceptible of being highly chloridized.

The next mine is the Besse—slightly developed, but gives high assays—even into the hundreds—from 400 to 500. It is on the same ledge of the Hornet. The Blackburn comes next in order on the same ledge, and is of high grade and has given good assays. Modoc and Pennsylvania are promising claims. Nature has done a great deal for Cottonwood. It has plenty of water for steam power, wood, &c. Nearby is a fine bed of salt—everything is such as to make mining easy, cheap and successful.

Our mines are true fissure and contact. Slate with granatite form the contact, the latter being foot-wall, I believe, of all the ledges. In these dull times manufacturing is at a standstill throughout the country. This certainly offers inducements for capital, east or west, almost unequaled on the coast. There are literally thousands of tons of ore on the surface that will pay well for milling

W.

Reno, Nev., Jan. 10th.

Sweetwater Mines.

EDITORS PRESS:—The shares of the Kentuck mine have in the last three or four days advanced from seven cents to 25 cents per share. An unknown party has agents trying to buy large blocks.

When the present economical management (Capt. Johns, Supt.,) took hold of the mine, it was thought to be exhausted, but now, after extracting 600 or 700 tons of ore and shipping $33,000 worth of bullion, it has several times that amount in sight. The last 50 tons of ore taken from the lowest workings, the 450 level, worked $72.30 per ton, most of which was stoped without blasting. The veins get softer as depth is attained.

The whim in tunnel No. 2, is 550 feet from the mouth of same; a shaft or winze is being sunk at that point and is now down 150 feet and is to be continued to a depth of 350 feet below the tunnel level.

Tunnel No. 2, now in 750 feet is gaining depth. As it advances it will gain a total depth of 600 feet on the vein, in 400 feet further.

Ore is being extracted from stopes above tunnel No. 2, and stored on the dump and in the mine. The company has at the mill and mine, an abundant stock of supplies to last all winter, and will, in the next four months, have ore reserves enough ahead, to meet a necessity long deferred, of getting the work of development sufficiently advanced to keep a large supply of ore ahead of mill.

The north end of the mine, some 1,200 or 1,500 feet, is all virgin ground, in which an ore body is likely to be encountered at any time, especially as the north extension (the Emm) has very rich ore on the 100-foot level.

Joseph Alcatras & Co. have relocated the Emm & Emm mine, at the south end of the McPatterson. It formerly belonged to O. F. Osborn, of the Los Angeles *Herald*. There is said to be considerable rich ore in sight.

There are three companies working all winter up Sweetwater canyon.

The assessment on the Kentuck is being paid rapidly.

R. T. S.

The Assay of Nickel and Cobalt.

EDITORS PRESS.—In several of my communications I have held out to your readers the hope or expectation of a new and comparatively simple assay for nickel and cobalt.

As the proprietors of this paper are also the publishers of my book on assaying, I deem it not impertinent to state that the promised process has been some time ready for publication, and will appear in the third part of the book, now in press. I prefer not to publish it in advance in your columns, leaving it to your discretion to do so after the issue of the book, should you think that desirable.

The book will also contain my new process for the assay of copper, both volumetrically and grairmetrically, a modified method for zinc, and one little known, though not of my devising, for arsenic.

The copper assay is not so expeditious as the method by potassium cyanide, but is free from certain defects which that has, and while it seems to be as accurate as electrolysis, is vastly less troublesome. Several of the methods in general use will also be given.

C. H. A.

MECHANICAL PROGRESS.

The Invention and History of Screws.

The screw is not, as many suppose, of modern origin, although it was not known to the ancient Egytians. The helix of the Greeks was the first thing known to be made in the form of a spiral, and was by them used in moving large, heavy bodies, and must have been constructed similiarly to our jack screws. It was invented by Archimedes, at Syracuse, about 250 years before the Christian era. He also used a similar device for the purpose of raising water. (This last invention has been used by the Egyptians since the Christian era.) History gives us no account of how Archimedes formed his spirals.

Another inventor and philosopher, who lived in the fourth century, tells how he made screws.

He used a template in the form of a right angle triangle, made from thin brass, which he wound around a cylinder, the edge of which he used as a guide to form the threads, after which the brass was removed. Of course this could not be done on very line screws.

Bessou, a Frenchman, in 1569, invented a lathe for cutting screws by the aid of a guide screw; and Hindly, an Englishman, improved it for use in watch making in 1740.

Ramsden, in 1776, invented a machine called a dividing engine, with which he made screws of a good quality.

Mandslay paid great attention to the manufacture of screws, and invented several machines for the purpose—but finally settled down to the stationary knife, or cutter and revolving rod. The rod revolved as in our modern lathes, and the cutting tool was fastened to a sliding plate, which was moved by a guide screw. This screw was made to revolve by belts and pulleys similar to some old lathes now in use. By changing the pulleys a different speed was given to the guide screw, and the screw was cut finer or coarser, as might be required.

From this sprung the gears now in use. Manslay at first made the guide screws of different sizes, and changed them instead of the pulleys, but this did not prove a success, as screws could be cut only tho same thread as the guide screw used.

To Manslay, more than any one else is Holtzapffel indebted for points in his lathe, which was in its day the best in use, and is still very much used. Holtzapffel wrote a treatise on the lathe in three volumes, which is still an authority. His lathe is used not only for the purpose of cutting screws, but for all kinds of fancy turning. There is or was not long since, one of them in this city.

The finest screw thread used in watches is 250 to tho inch. These are made by automatic machines, and without the aid of a magnifying glass no thread can be seen at all. It takes over a hundred thousand of these to weigh a pound.

We cannot recount the thousands of different uses to which screws are put, but it may be of interest to know that the watch which you carry in your pocket, if it has a compensating balance, has 44 screws, 22 of which are in the balance wheel; and if you have one of the best watches, these 22 screws are made of gold.

In the modern screw machine, different sizes of dies are used. Knight, in his Mechanical Dictionary, describes them as being stocked in a circular head, and such a one is selected and presented to the plank as may be of the size desired. It has also a rest with a transversely sliding tool post, whereby the screw may be cut off or dressed.

Automatic screw machines are now in use in all large factories. A company in Hartford, Conn., holds the principal patents on this kind of machinery.

There are various kinds of stocks and dies used for cutting screws, but as they are only used for special purposes or on a small scale, they require no particular mention. Their origin is unknown.—*Sewing Machine News.*

A New Process of Steel Making.

A patent has recently been granted to Mr. W. A. Otto Wuth, of Pittsburgh, for a new process of producing steel from wrought iron with plumbago, the steel produced being, it is claimed, of a high grade and substantially free from sulphur and phosphorus and containing a definite percentage of carbon. The process consists in making the steel from wrought iron that is practically free from phosphorus, sulphur and carbon by melting it on an open hearth in contact with a form of carbon which will not oxidize at the heat necessary to smelt the iron, but which will unite with the iron at that heat.

Any wrought iron which is sufficiently low in phosphorus may be used as the basis of this process, though muck bar, made according to a previous patent of Mr. Wuth, he preferred as being especially pure. The decarburized iron of the requisite purity is first cut into pieces of convenient length and placed in the hearth of the furnace in layers piled one above the other. Between each layer of iron is spread a thin stratum of plumbago, preferably in a pulverized condition, although it may be used in lumps. For this purpose the inventor employs the plumbago of commerce, but of good quality, containing about 98 per cent of carbon and two per cent of silica, with a trace of iron. The hearth of the furnace is charged with alternate layers of wrought iron and plumbago, until it is sufficiently full, the relative thickness of the layers depending upon the amount of carbon which it is desired that the resulting steel should contain.

If the iron were absolutely free from slag, and the plumbago were also absolutely pure carbon, then the proportions of the charge would be the same as the proportions of iron and carbon in the desired steel product; but as there is always more slag in muck bar (not, however, exceeding one per cent), and some silica in the plumbago, the proportions of which can be ascertained before the furnace is charged, the necessary allowance for these elements will have to be made, and the percentage of carbon can be regulated with great exactness, so as to produce steel, it is claimed, very nearly approaching to an ideal steel. The furnace being thus charged with muck bar and plumbago, the charge is melted in the usual way, and the operation further carried on as in the well-known open-hearth process. Before the melted metal is withdrawn from the furnace, a small and definite amount of spiegeleisen or ferromanganese is added. By this process Mr. Wuth says he has made several charges of steel of 12 tons each, containing as low as one-hundredth of 1 per cent of phosphorus, and that he will be able to produce any kind of fine steel that may be desired.

A WOODEN HAMMER FOR BENDING IRON.—A correspondent of the *Blacksmith and Wheelwright* writes that journal as follows: In a shop in this town where they make all sorts of heavy draft wagons a specialty, I saw recently a smith working on a fifth wheel. He lifted a long bar out of the fire at a glowing heat, and began filling it with hammer marks in trying to convert it into a circle. I let him get through his first heat, and then suggested if he would give me a condemned six-inch hub, an old spoke and a drawing-knife, I would give him a lesson in fifth wheel bending. The hub, spoke and drawing-knife were soon provided for me. I fitted the spoke in the hole of the hub, and thus had a wooden hammer. I took the other bar, raised my heats, and beat the fifth wheel with my wooden hammer, and turned the job over to the boss. He said, "Well done." Perhaps there are some others of the craft who are not acquainted with this "wrinkle."

THE WIRE AGE.—In history we have the golden age, the iron age, the age of brass, and other periods similarly marked. Future annalists may well describe the present period of our history as the wire age. In no part of the economy of our daily lives are we divorced from wire. It is our slave, and yet an ever present master. Sleeping, we repose on wire mattresses. Eating, we see foods that have passed through sieves, and which are sheltered from insect appetite by wire covers. Calling, we pull wires to ring curled wire gongs. Traveling, we are conveyed by cable or electric railways, hoisted by elevators hung on wires, and hurled over wire bridges. We announce our coming by telegraph or telephone wires, and we tread our way by night through streets lighted by means of electric cables. Across our fields are strung thousands of miles of barbed wire. Our clocks are set by wires, our watches are run by wires, our books are stitched with wires, our pictures are hung by wires, and our politics managed by wires.

BESSEMER STEEL NAILS can be made, it is reported, much more cheaply than iron nails, owing to the cheaper preliminary process in preparing the metal for making them. A few men can do what hundreds have been required to do heretofore. The complaint is made, that having a smoother surface than iron nails, those of steel have less grip on the surrounding material. But they have not yet been used extensively enough to test their value fully, and possibly some way of overcoming this objection—if it is a valid one—may be devised. Two establishments, one at Bellaire, Ohio, and the other at Worcester, Mass., are now manufacturing steel nail plate. A third is in process of erection.

PROF. CALVERT has recently made the interesting discovery, by practical tests, that the carbonates of potash and soda possess the same property of protecting iron and steel from rust as do those alkalies in a caustic state. Thus it is found that, if an iron blade be immersed in a solution of either of the above carbonates, it exercises so protective an action that that portion of the iron exposed to the influence of the damp atmospherie air does not oxidize, even after so extended a period as two years.

PECULIARITIES OF MANGANESE STEEL.—Manganese steel is very dense, tough and hard. It does not require to be forged or rolled to impart strength to it like most steel. It does not tarnish readily; magnet does not attract it. When brought to a white heat and plunged in water it turns soft and not hard. Its castings have very few flaws. It is made by pouring from 10 to 12 per cent of rich ferro-manganese into molten steel, and mixing the two together before the alloy is run off into ingots.

In the PRESS of Dec. 29th, page 386, in our article on "Calaveras county Resources," a line was made to read as follows: "These seams were generally from 12 to 20 or 30 feet wide." It should have read inches instead of feet.

SCIENTIFIC PROGRESS.

Influence of the Moon on the Earth.

The tides are caused mainly by the moon, as it were, catching hold of the water as the earth revolves around on its axis. This must cause friction on the earth as it revolves, and friction, as every one knows, causes loss of power. Suppose a wheel, with hair round its rim, like a circular brush, such as is used for hair brushing by machinery; if this brush be revolving rapidly, and we hold our hand ever so lightly on the hair, so that it is slightly rubbed backward as the wheel revolves, we can understand that the speed of the wheel will be gradually diminished, until at last it will be brought to a standstill, provided there is no additional power communicated to the wheel by machinery or hand, beyond what was given to set it spinning round. Now, this is somewhat analogous to what is happening to the earth in its rotation. There is reason to suppose that the action of the tides is slowly but surely lessening the speed of the earth's rotation, and consequently increasing the length of the day, and that this action will continue until the earth revolves on its own axis in the same time that the moon takes to revolve round the earth. Then the day, instead of being 24 hours, as now, will be about 28 days, and the earth will be exposed to the full blaze of the sun for about 14 days at a time. The change this will bring about on the face of the earth can hardly be exaggerated. All life, both animal and vegetable, will be destroyed; all water will be evaporated; the solid rocks will be scorched and cracked, and the whole world reduced to a dreary and barren wilderness. It is supposed by some that the moon has already passed through all this; hence, its shattered and bare looking surface. That the earth, being so much larger, has more quickly acted upon the oceans, which once were upon the moon's surface, and stopped almost entirely its revolution round its own axis, thus causing it to have a day equal to 28 of our days, and the heat of the sun has already done to it what in future ages it will do to the earth.—*Harper's Weekly.*

THE RIGIDITY OF THE EARTH.—Sir Wm. Thompson recently delivered a lecture in Hopkins Hall, Baltimore, on "The Rigidity of the Earth." The object of the lecture was to show that the hypothesis to which the geologists have so rigidly clung, that the interior of the earth is continuously liquid, is not true. The theory is based upon the assumption that the deeper down we bore the warmer the temperature, until finally, at the depth of about 50 or 60 miles from the surface, the increase being constant and at the rate so far as observed, the temperature is far above the boiling point. This the lecturer characterized as a very large assumption upon very small premises. He endeavored to show that the hypothesis of those geologists who contended that the earth has been habitable for millions and millions of years is contrary to known physical laws, and then showed that the rigidity of the earth, as demonstrated by the effect of the tides, could not be maintained if there was only a thin crust and a large liquid interior. The lecturer contended that the interior was not a continuous liquid mass, but probably consisted of mortared rocks, with limited spaces of liquid matter, so arranged as to support the exterior. Earthquakes he regarded as probably due to the falling in of solid matter, and their occurrence as evidence of this theory.

SCIENTIFIC DEDUCTIONS by the most profound investigators are not always to be implicitly trusted, as a member of the geological section of the American Association for the Advancement of Science at its late meeting found to his chagrin. It seems that Professor Williams, of Cornell University, read a paper on a geological topic, which was discussed by Profs. Hall and Claypole. The latter, in support of Prof. Williams, declared that the spirifer disjuncta and the spirifer mesostrialis, which are shells supposed to belong to different geological periods, exist side by side in the same rocks. Prof. Hall, who is State Geologist of New York, and is one of the foremost geologists of the world, asserted that Prof. Claypole's statements were erroneous, and very excitedly offered to eat his hat if such a rock were shown him, and give his coat and boots to the person making the exhibit. Prof. Williams took the first train to Cornell, and from that place expressed a box to Prof. Hall, which arrived before the adjournment of the Association, and when opened was found to contain a rock in which the two spirifers were undeniably present. It is not known whether the discomfited Professor has actually made a meal of his hat, but he has been called upon to surrender his coat and boots to the triumphant discoverer of the rare, but not impossible, combination.—*The Iron Age.*

NATURE'S FORCE PUMPS.—Trees and plants are continually pumping up water through every root and every part of the stem and branches, to discharge it through the leaves into the air as vapor, or, if the temperature be low, in drops called dew. This shows the need of all plants for moisture at the roots, and the impropriety of leaving weeds to pump that moisture away from the plants or trees upon whose produce the husbandman depends for a living. Grass is an inveterate pumper, as may be seen from the general dryness of the ground beneath it, and there cannot be a doubt of the injury it does to fruit trees when growing over their roots. Some plants and trees pump far more vigorously than others, and these are of great use in wet soils. The eucalyptus and sunflower are among the most vigorous agents for the transfer of water from the soil to the air, and it is in this way mainly that they purify malarious regions. A eucalyptus tree of good size near a well will, it is said, as soon as it gets its roots into the well, pump it dry and keep it so. This tree has greatly mitigated, if not banished, the marsh fevers of the low, undrainable Campagna of Rome.—*Witness.*

ANIMAL REGENERATION.—The power of regenerating lost parts in animals is greatest where the organization is the least perfect, and while the animal is in the young or larval state. It is really a process of budding. Certain worms may be cut into several pieces, and each part will regain what is needed to complete the mangled organism. The star fish can reproduce its arms, the snail its tentacles, the lobster its claws, the fish its fins, the spider its legs and the lizard its tail. As closely related to the above may be cited the fact that Professor Mosoley, of the famous Challenger expedition around the world, has discovered eyes in the shells of chitonidæ, no less than 11,000 being contained in the shell of a single animal. As the shell grows larger, new eyes are formed. No other molluskas have any sense organs in their shells, but the chitonidæ, in addition to eyes, have elaborate organs of touch permeating their shells.

MEASURING THE MOTIVE POWER OF THE HUMAN BODY.—Dr Marey, of Paris, read a paper on this subject at the International Congress of Hygiene, in which he described the ingenious manner in which he had succeeded in measuring the motive power of the human body in its every movement. Planks, with India rubber coils underneath, recorded, by expelling the air they contained, the exact pressure of the foot. The motions were measured; and photographs, taken in one thousandth of a second, recorded every attitude during a leap, and where and when the effort was greatest. By such studies Dr. Marey had been able to prove that something was gained in the power of walking in quickening the step from forty to seventy-five steps per minute. But the latter figure was the extreme limit; with a greater number of steps, power would only be lost instead of gained.

THE POWER OF RAIN.—In estimating the motive power of rain, Prof. Tait calculates that the amount of force required to convert one pound of water from the sea or from moist earth into vapor is equal to the force exerted during one-half hour by a horse. This is given out again in the form of heat as it condenses, and the pound of water falling as rain would cover a square foot or ground to the depth of rather less than one-fifth of an inch. Thus one fifth of an inch of rain represents a horse-power for half an hour on every square foot; or, on a square mile, about a million horse-power for 14 hours. A million horses would barely have standing room on a square mile.

FOR SCIENTIFIC UTILIZATION.—The Washington Monument, like Bunker Hill Monument in years past, is to be used for making experiments in aid of science. Experiments regarding falling bodies will be made, and the first proposed is to see whether a renowned baseball catcher can catch a ball thrown from its top. It is roughly calculated that the ball would take five and a half seconds to descend, and at the bottom would be going at the rate of 180 feet per second, or in the neighborhood of two miles per minute. The resistance to be offered by the person who attempts to catch it would be only 110 pounds, or, in other words, he would have to put forth enough strength to lift that weight.

MEASURING THE TEMPERATURE BY TELEPHONE.—A plan of accurately measuring the temperature of a distant station by telephone has been described by Dr. R. Lenz. Two wires—one of silver and one of iron, or one of antimony and one of bismuth—connect the observer with the distant place, and any variation in the end loops of the wires, as regards temperature, causes a sound in a telephone, which ceases when the temperature at the observer's loop is brought to the same point as that of the opposite end, which may be miles away.

ONLY ONE COLORING SUBSTANCE IN FLOWERS.—A student of the colors of flowers, M. Schnetzler, contends that only one coloring substance exists in plants, and that the various colors of flowers are due simply to the modifications made in this substance by the acids or alkalines contained in the plants themselves.

THE DISTRIBUTION OF PLANTS.—A French scientist, Mons. F. Krasen, has sought to demonstrate that certain anomalies in the distribution of plants, according to altitude, must be due to a comparatively recent change in the elevation of the mountains on which they grow.

JOINING SEVERAL NERVES.—Two cases of the successful joining of divided nerves have been reported to the Paris Academy of Scienees, function being restored in one case to a nerve which had been divided for 15 years.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

As so much space in this number of the PRESS is devoted to a general summary of mining work on the Pacific Coast for the past year, we have condensed our usual summary of current mining news to one page, instead of two.—EDITORS PRESS.

CALIFORNIA.

Amador.

SUTTER CREEK.—Cor. Amador *Ledger*, Jan. 17: The Mahoney is once more the scene of an annoying accident. The barrel of the pump broke at the 500-ft level, rendering the whole pumping machinery inoperative. A new one was ordered from Knight's foundry immediately, which they hope to get in position in a day or two. The water is very strong, but fortunately the Lincoln pump is working nicely, and will probably be able to keep the water from rising above the 500-ft level.

THE NEW YORK MINE.—Amador *Dispatch*, Jan. This mine which is located about three miles from Jackson is being developed in a lively manner under the management of Mr. W. G. Anderson. Two men are at work in the shaft and four on the flume. The shaft is now down about 90 ft in all at which depth the ledge is from 12 to 14 ft wide. The rock thus far taken out looks well and shows considerable free gold and there is every indication that it will prove to be a valuable mine when fully developed.

CONTRACT LET.—The contract to run the big tunnel at Middle Bar 500 ft further was awarded to C. Fuller and B. Claich, for $10.50 per foot, contractors to find powder, candles and fuse, and to work three shifts of not less than four men each. The tunnel is now in over 1700 ft. The contract price is considered very low, considering the distance the rock has to be run out.

MAMMOTH.—At this mine the 10-stamp mill has kept steadily at work for some time. There is plenty of ore in the mine to keep the mill running constantly. The greatest difficulty experienced is on account of lack of ventilation.

MISCELLANEOUS.—Messrs. Nevills and Nichols, the owners of the Moore mine, are expecting to start work on that property at once. The Huntington roller quartz mill, for the Morgan and Shugert claims in Hunt's gulch, passed through Jackson to its destination, last Saturday. At the Wetzler quartz claim, near the Mammoth, a small vein of very rich ore was struck. It has the same characteristics as the rich quartz met with in the Mammoth, carrying arsenic and other base metals, as well as a liberal supply of gold. The strike furnishes another proof that the rich gold-bearing quartz seams are plentifully scattered over the mineral region around Middle Bar. John Wetzler and Martin White are developed the claim.

El Dorado.

WILL START UP.—*Mountain Democrat*, Jan. 17: Fred. Bendfeldt has got the water out of the gravel mine at Smith's Flat, and on Tuesday last, Wm. Rowlands made a survey preparatory to starting up the mine. This we believe to be a fine property, if properly opened up.

Inyo.

RICH ORE.—W. A. Greenly was over at Big Pine last Monday. He had samples of ore from a ledge recently discovered by him in Deep Spring district. The ore is very rich; pieces as large as a man's fist would when broken into fragments, hang together like a bunch of grapes. Native silver, in scales and veins, runs all through the ore. The ledge, so far as was yet seen, runs from a foot to 18 inches in width, but enough work has not yet been done to determine the extent of the ore body. The snow having been cleared from the trail the miners have returned to Beveridge, where work will soon be resumed. The Lasky mill will be put in operation some time during coming week.

Mariposa.

HORNITOS.—Cor. Mariposa *Herald*, Jan. 16: Last Saturday some boys were jumping near Mr. Adam's blacksmith shop and used for a weight a piece of quartz rock. One of the boys discovered that one end was heavier than the other, and upon examination found it covered with gold. He took it home, mashed it up and took out $12.75. Little Miling Campodonico also found a chispa yesterday while going to the spring for a bucket of water for the school. Messrs. Ham & Champion have several tons of ore crushed at Mr. Barcroft's mill last week. They expected to get at least $40 per ton, but I am informed by one of the parties that it paid but $6. The ore came from the Zamora mine. The Quartz mountain has also shut down on account of wet weather.

COULTERVILLE. — Mariposa *Gazette*, Jan. 17: Shreve and Goss have built a two-stamp mill on Black creek, about one mile below town. There are at present working on custom rock, and say it is paying. Water power is used as long as water lasts, then steam is used.

Plumas.

INDIAN VALLEY MINE.—Greenville *Bulletin*, Jan. 17: All legal complications affecting the title of the Indian Valley mine have come to an end. The title to this mine is now clear. It is considered one of the best mines in the county, and a great deal of money has been taken out of it. The developments in the Green Mountain mine prove conclusively that our mines improve as a greater depth is attained.

GREEN MOUNTAIN.—Above the Green Mountain mill where the ditch crosses the ravine, the ground is of such a nature as to slide more ore less, thus interfering with the supply of water to the mill. The superintendent has concluded it better to insure no further trouble on that score by building a flume across the ravine and of such length as to permit the slide to pass under the flume without interfering with it. The drill are now running in the face of No. 6 tunnel. The Sulphuret chute will be reached before the end of the month. An upraise has been made from No. 6 tunnel 130 ft back of the face. From this good pay ore is being taken continually. More men will be put into this chute as it is opened out. As soon as the Sulphuret chute is reached, an upraise will be made to connect No. 6 tunnel with No. 5 tunnel. This will be necessary for practical working purposes. The marked improvement in the mine is gratifying, and the indications are that at still greater depth, lies an immense quantity of good ore.

Shasta.

PLACER.—Shasta county *Democrat*, Jan. 17: Albert Houston is hard at word getting out 3,000 feet of pipe and a little giant from a gulch near Townsend's Flat and placing it on a rich piece of placer ground on a bench between Lower Springs and Salt creek. They expect to be piping the ground in about two weeks. Tom Green's mine near French gulch, with a little cannon-ball mill, is turning out $15,000 monthly dividends. During the late storm the shaft of the Silver King mine of Lowrey & Brincaid, s near Centerville, filled up with water and hoisting or ore has been discontined for the present. It is proposed to put in a steam pump to handle the water. At the bottom of the shaft the vein is widening and the ore is growing richer. This is one of the most remarkable finds ever made in Shasta county. The ores are chlorides and bromides of silver and resemble strongly the ores of Reese river. In fact, the great similarity of the rock to the Reese river ore induced Mr. Lowrey, the locator, an old Reese river miner, to locate and develop the mine.

Sierra.

BALD MOUNTAIN MINE.—Sierra *Tribune*, Jan. 17: The gravel lays in benches and is very rich, paying as high as $10 a carload. An incline 90 feet long, with a fall of about one foot in four, through which to work this deposit is nearly completed. It has a single track and the cars are handled with a windlass. The tunnel which the Co. is running in the South Fork ground is in hard rock.

BALD MOUNTAIN EXTENSION MINE.—The Bald Mountain Extension Company cleaned up 68 ounces of gold last Sunday as the result of one week's work in the South Fork ground. Only one breast is being worked at present. Over 200 feet of the incline from the turnout to the main tunnel are completed, leaving only about 40 feet to be run. By the time that is completed four new breasts will be opened out and a big increase in the output of bullion may then be reasonably expected. The channel is quite wide and gives splendid returns wherever prospected.

THE RAINBOW MINE.—Over $800 was taken out of the upper workings of the Rainbow mine, at Chipp's Flat, in a short time last week. The new tunnel has so drained that part of the mine that it requires but little pumping to keep it entirely clear of water. Work will be continued in that part of the mine. A ledge was encountered in the lower tunnel last Wednesday week but it has not been sufficiently developed yet to determine whether it is the main ledge or not. However, the appearance of gold in the rock is a very flattering indication that it is. The tunnel is not quite into where it was expected to reach the pay chute.

Trinity.

THE NORTH STAR.—Trinity *Journal*, Jan. 17: This is the title given a quartz discovery on East Fork, which is owned by P. A. Lefren & Co. The rock from the ledge, which is about two and a half ft in width, prospects well, and the owners are certain that they have struck it "big." Certainly, from a prospect seen of the rock, it does look as though they really have some pumpkins. Mr. James Brown, a practical miner, is now superintending the development of the mine.

THE BEST LOCALITY.—Yreka *Union*: Leonard Miller, of Oro Fino, who, for some time past has been building a quartz mill on New River, arrived here a few days ago. He gives a glowing account of the mine of that section. He says there are many quartz leads there that deserve to be classed with the very richest in the country. While he and another man were prospecting they found some float from a pound of which they extracted $25. He believes New River to be one of the best localities for prospecting in the country. Day, Moor & Hubbard, on East Fork, have been crushing rock for some time, and will make a clean-up about the middle of next month. They are confident that the result will excel the previous clean-ups. About three miles above Van Matre's ranch, on what is called Mule Creek, parties are at work on an abandoned quartz ledge and we are informed have found encouraging prospects.

NEVADA.

Washoe District.

OPHIR.—Virginia *Enterprise*, Jan. 17: The main west drift on the 500 level has passed through the west wall of the vein where it has been stopped in order to allow the water to drain off from the old Mexican shaft and the saturated ground surrounding said shaft. The flow of water from this source is steadily decreasing.

HALE AND NORCROSS.—On the 2800 level west crosscut No. 2 has been in a solid body of quartz for the last 25 feet. This quartz is of the same kind as was passed through in west crosscut No. 1 before the ore steak was reached. Crosscut No. 2 is liable to cut into ore at almost any time. Work will probably not be commenced on the 2900 level until the drift on the 3000 level from the Combination shaft has conhected with the bottom of the main Norcross winze.

COMBINATION SHAFT.—The new hydraulic pump on the 3000 level is now running very smoothly, and will soon be so far regulated that it may be put up to its full speed. Some slight alterations are occasionally made, and parts tightened up as the bearings become smooth from friction. The pistons or plungers have been unpacked and made to fit more closely than when the pump was started. No pump of the kind in any place in the world is working at such a great depth below the surface of the earth—2000 ft.

CON. CALIFORNIA AND VIRGINIA.—On the 1550 level are repairing the main drift. Stope No. 6, on the 1750, has been repaired and put in order for the extraction of ore. They are now hauling the old workings, in which some ore that will pay for working is being found and extracted.

BEST AND BELCHER.—The west crosscut on the 825 level, at the Gould and Curry north line, is still in vein material of a very promising appearance Streaks of the quartz are occasionally met with that give low assays. There is on this level a large area of unexplored ground, parts of which contain streaks of quartz of considerable magnitude.

SAVAGE.—The E-street tunnel is now passing through the old stopes, but has not yet reached the point where it is expected that ore will be found.

CROWN POINT.—The old upper levels continue to yield a considerable amount of low-grade ore, which is being sent to the mills on the Carson river for reduction. Much ore has been opened up ready for extraction.

ALPHA.—A winze is now being sunk on the 900 level to prospect the large body of quartz, which has heretofore been explored from the 600 to the 900 level, below the latter point.

YELLOW JACKET.—The usual amount of low-grade ore is being extracted and sent to the mills on the Carson river. A considerable amount of prospecting is being done.

MEXICAN.—The main south drift on the 2700 level was last week cleaned out and repaired.

BELCHER.—A considerable amount of low-grade ore is still being extracted and shipped to the mills.

SIERRA NEVADA.—Are cleaning out and repairing the main drift on the 2300 level preparatory to making explorations at that point.

Bernice District.

GOOD RETURNS.—*Silver State*, Jan. 16: W. Williams arrived in town yesterday from Bernice, bringing with him nine splendid bars of silver bullion, which was valued at $10,500, and were shipped to San Francisco. This bullion was the result of 27 days' work of the Golden Crown Mining Company's mill. The company make regular monthly shipments of bullion. Mr. Williams informs us that his company employs at the present time 50 men; and he has room for the employment of six more persons in cutting wood for the mill. The mill is one that they have at the present time on lease; is of five stamps, and the ore which is now being worked goes from $60 to $100 per ton. In the spring they will put up a new ten-stamp mill, and will have a great plenty of ore to keep it running steadily. Their mine at the present time is looking far better than it has ever heretofore. Last week they made a new and important strike, and reached ore in a large quantity, the vein being four feet in width, and paying $100 per ton. Their bullion goes over .900 fine, and he says they have shipped bullion that ran up to .985 fine. The bullion contains but a small per cent of gold, however. He informs us that he worked 25 tons of ore from the Wild Goose mine in that district that produced $100 per ton, and that Mr. Healey has plenty of ore that will pay $125 per ton, but it is impossible to get it worked, as the mill cannot reduce the ore that is extracted from the Golden Crown mine. He says there are also many other mining properties there that contain immense bodies of ore, and that it will be but a short time when great activity will prevail all through that section of country.

Columbus District.

MOUNT DIABLO.—Candelaria *True Fissure*, Jan. 16: The north crosscut on the sixth level is in 121 ft and the west drift on the same level is in 60 ft. The crosscut near the face of the west drift on the fifth level shows a 3-ft ledge which is much mixed with waste, but contains considerable $50 ore. The raise from this drift is up 30 ft, and shows a little ore of fair grade. In the intermediate, between the third and fourth levels, west of the shaft, some $90 ore is being taken from a small bunch. In the intermediate, between the second and third levels and east of the shaft, there is a small stope of $50 ore that looks promising. The stope west of the shaft, between these levels, is looking well. The intermediates, between the first and second levels, are giving some ore of fair grade, and some ore of fair grade is being taken from the first level.

Comet District.

SUPPLIES.—Pioche *Record*, Jan. 10: The prospectors out at Comet District are all putting in a big supply of grub. All ont there have about six months rations on hand. James Burrows brought in a load of $500 rock Thursday, and left with a wagon load of grub for himself.

Osceola District.

DITCHING AND FLUMING.—White Pine *Reflex*, Jan. 10: James Benson who returned from the neighborhood of Osceola, says ditching and fluming is going right along and that the calculation is to have all in readiness to catch the June thaw.

Tuscarora District.

BELLE ISLE.—*Times-Review*, Jan. 16: Upraise on east vein, 150-foot level, has been carried up 65 feet. Progress five feet, ledge small, ore low-grade.

INDEPENDENCE.—In the workings above the 175-foot level, the ore seams are very small, and but little ore is being extracted.

GRAND PRIZE.—No change of importance. Mill is now running all right and working up the ore on hand.

NAVAJO.—The stopes on the different levels are looking fair. The usual grade and quality of ore has been milled the past week.

Wild Rose District.

PARADISE.—Virginia *Enterprise*, Jan. 16: J. V. McCurdy arrived on the Comstock yesterday. He says he is going right ahead with the construction of a new mill at Paradise to take the place of that destroyed by fire. They began shipping lumber and timbers from Boca yesterday. Not much can be done in the mine until the new mill is completed, as there is no place for the ore. There are already over 700 tons of ore piled up at the site of the mill, where it is in the way. The mill that was burned was, of the kind, as perfect as a mill can be made. It cost $75,000, though it contained but ten stamps. The new mill will differ from the old one in that it will contain concentrating machinery. Mr. McCurdy says they will be able to resume paying dividends soon after the new mill starts up.

COLORADO.

ITEMS OF INTEREST.—Colorado *Mining Gazette*, Jan. 16: John Needham's "flat vein" is turning out some fine ore. The Tropic, on Seaton mountain, is yielding well for the lessees. The Little Beula lode is turning out some elegant stamp mill dirt. The most extensive developments on Soda creek will be found on the Gold Leaf lode. Nearly all the mines on Seaton mountain which are being worked are producing profitably. Captain Hall's Queen mine, Seaton mountain, is looking splendid. Ore is being shipped steadily. The deepest shaft in the Soda creek gold region is on the Golden Leaf lode and is 190 feet deep. Six cars of ore from the Joe Reynolds mine arrived at the Idabo Springs Public Sampling works this week. Mr. Dan Doyle is working the Ute load in Bullion camp. This property is one of the best in this now celebrated camp. Five sets of lessees are now working on the Grand View mine, Seaton mountain, with good success.

ARIZONA.

A PROSPECTIVE CITY.—Cor. Tombstone *Record*: At Clark City, the mining camp in the Swishelm mountains, buildings are going up as fast as the lumber comes in. Wood and water are plentiful, also labor. The Great American mine employs about 50 men. Considerable prospecting is being done.

MONTANA.

BLUE BIRD.—Butte *Miner*, Jan. 14: There seems to be no let up to the ore extraction, but rather a steady increase. New developments in and about Butte are daily going on and with the most gratifying results. The Blue Bird property, recently purchased by a California company, is being put in shape for heavy work. Superintendent Fleming has erected a new ore-house and is putting in hoisting machinery, erecting a gallows frame and putting up a large whim. At 50 ft a large body of 35-ounce ore was struck. Ore is being taken out of the tunnel at a cost of $1.50 per ton. The vein is six ft wide and stoping is being prosecuted with vigor. The assay valuation is 50 ounces silver. The Mono has been developed on the surface by an 80-ft shaft. The average width of vein is 2½ ft, carrying 70 per cent manganese and 20 ounces silver. There is a continuous body of this ore so far as the east level has been run, 300 ft. One hundred and fifty ft of the level has been stoped out on the surface having plenty of ore on the face.

THE GAGNON.—Stoping continues above the 600 level, in the 500, 400 and 300. About 30 tons are taken out daily and sent to the Colorado smelter and the concentrator. The management continue to observe the most rigorous policy in assorting, separating the poor and rich ores which go from 30 ounces to 15 ounces in silver. About 25 men are employed. The Black Bear, north of the Alice, and now under lease to the Devlin Brothers, has a shaft down 100 ft. They are taking out 60-ounce ore from the east level and having it milled at the Moulton. The Katie Morris, just west of the Mountain Boy lode, is under lease to McMillan & Co. The shaft is down 130 ft. A 60-ft level has been run west from the 100-ft station. The level was driven in on the vein and 60 ounces and upwards of free-milling silver rock is being taken out. Over 100 tons of this rich material is now on the dump. The Margaret Ann lode, situated north of the Alice mine, is owned by the Montana and Baltimore M. & M. Co. The Margaret Ann is one of the best properties north of Walkerville. The pay streak is 3½ ft wide, and averages 47 ounces free-milling ore and $6 in gold. The new mill of 15 stamps is completed and ready for work.

STAR OF THE WEST.—Butte *Miner*, Jan. 14: A visit to Meaderville yesterday resulted in the discovery that the damage done recently by the cave in the east level in the Colusa was of more importance than at first supposed. Stoping had been done for a great distance from the shaft east, on the 160-ft level. This work was prosecuted so faithfully and well that the surface was very nearly reached when the top ground went down, taking with it a portion of the tramway. Water from the surface began pouring in, and materially changed the aspect of affairs. This body of water took its natural course, finding its own level finally in the sump. Two compound pumps were on the ground and immediately put in working order. Their capacity is 900 gallons per minute, and both are kept busy hoisting water from the sump in the main shaft, which is 600 ft in depth. Developing is going on in the 500 and 600-ft levels. Timbering is going on and all kinds of work necessary to put the mine in excellent order. The West Colusa and Company Parrot have a force of men at work in the lower levels and are driving both ways. The Star of the West is under lease to Samuel Hoar, who is sinking on the main incline, which is now down 240 ft. The ore body is from 20 to 36 inches in width and very rich. Stoping is being done in the 100-ft level and the ore extracted sent to the Colorado smelter.

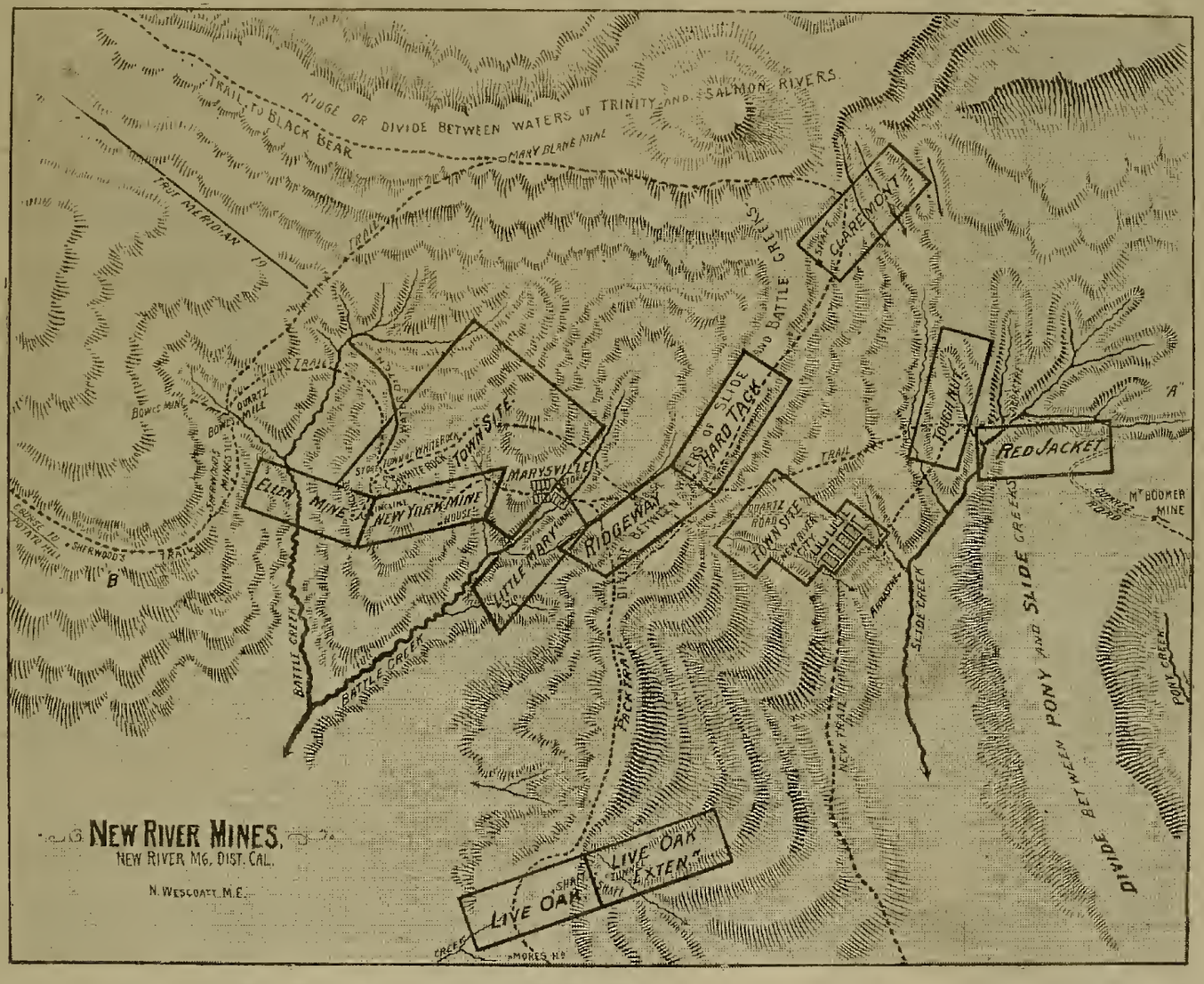
UTAH.

FINANCIALLY DISTRESSED.—Pioche *Record*, Jan. 10: The Mountain Chief Mining Company, near St. George, Utah, where about 30 coal burners went from here, we learn from a couple of men just from there, is bankrupt. Their checks have been protested and the company bas closed down. The ore in the mine goes high in lead, but carries very little silver. The low price of lead is said to be the cause of it, but, from what we learn, we believe the trouble is owing to the lack of funds.

REVIEW.—Salt Lake *Tribune*, Jan. 10: The shipments from this city for the week ending Saturday, January 10th, were 24 cars of bullion; no ore. The new and higher rates of freightage did the business, as designed, and no (or but slight) shipments can be expected of ore away from Utah till there is a change. There is no relief, either in the embargo of Wood River ore; no Queen of the Hills ore has been received during the week, and but little from that region. The receipts of ore and bullion in this city for the week ending January 14th, was $103,999.45, of which $79,859.45 was bullion and $24,140 ore. The week previous the receipts were $106,747.10, of which $34,291.10 was bullion. The shipments of the Ontario for the week were 50 bars, of the value of $33,884.45; total for the present year, $65,982.99. The product of the Hanauer smelter for the week was nine cars of bullion, valued at $23,800. The Germania smelter produced during the week ten cars of bullion, $22,176. The ore receipts here for the week were valued at $24,140, of which the Crescent shipped three lots, valued at, $8,300. The rest of it came from Idaho, of which the Minnie Moore, Wood River, sent $13,190 worth, and $2,650 worth came in two cars, classed as "Idaho ores."

The New River Mines.

The attention of the mining community of California is just now being turned to the new gold mining region in Trinity county, known as the New River District. The mines were discovered last summer, but no development work of any description has been done upon them. Enough has been shown, however, to warrant the belief that a district of some value has been found, and no doubt a great many men will go there in the spring. There is quite an extent of country to be prospected. The ledges run at right-angles with the vein, and it is thought that for some 60 miles more or less mines will be found. The accompanying map shows the central portion of the district, and was made by Mr. F. Weasco t, U. S. Deputy Mineral Surveyor. Mr. James H. Crossman, the well-known mining man, furnishes the *Post* with a description of the region, from which we condense the following:



The New River mining district is situated on the headwaters of the tributaries of New River, a branch of the Trinity. It takes its rise in the Salmon range of mountains, the dividing ridge between the waters of the Trinity and the Klamath rivers, and at a point where Humboldt, Siskiyou and Trinity counties meet. New River city, of New River district, is forty-five miles as the crow flies from Eureka, at Humboldt bay. The topographical features of the northern portion of Trinity county, in which we find this new district, are strongly marked, and show evidence of, at no remote period, violent volcanic activity, upheaved regardless of order or system, tossed and tumbled into every conceivable form.

The main mineral belt in which the mines of New River district occur, varies from three to four miles in width and on its line of strike in a northwesterly and southeasterly direction is traceable for a distance of more than 60 miles. The newly-discovered mineral district, the Enterprise, situated 30 miles southeasterly from New River district, on the east fork of the Trinity, where W. T. Coleman, of this city, has recently made purchases of mines, is on the same formation; thence following the belt we reach the rich mines and placers contiguous to Weaverville and Shasta. This belt is composed of slates (serpentine and allied metamorphic rocks) with intrusive dykes of dinrite (greenstone trap), syenite and porphyry. The veins are, as a rule, small, varying from a few inches to several feet, the gangue, ferruginous quartz, carrying free gold—the line of decomposition probably extending to a considerable depth. The altitude being about 4,000 feet, the snows of the winter soon melt and run off. The side-hill is densely covered with timber—fir, pine and oak. The branches of the streams all carry running water—crystal springs of icy coldness are often seen. Water for motive power is obtainable in the creeks in near proximity to the mines.

Placers.

The beds of Slide and Eagle creeks immediately below the newly discovered mines, are virgin for a distance of six or seven miles—a good field for the placer miner, as the north fork of New River, below the junction of these two streams, has been extensively worked with results of one ounce per day to the man, with an occasional big nugget and rich strike. It is reasonable to infer that the intermediate ground immediately below the rich veins recently discovered, should be correspondingly rich in placer gold. The depth of the soil, together with the dense growth of heavy timber, has heretofore deterred the prospector from testing these grounds.

New River mining district, contains three rival town sites, each aspiring to be the metropolis of the district—the first, New River City, being in the vicinity of the leading mines, and situated, as it were, at the gate of this new El Dorado, where the wornout traveler will be quite willing to rest and stable his tired steed. It is already building up as rapidly as lumber can be procured. The next town, three-quarters of a mile distant, is known as "Marysville." Thence, northerly, one-half a mile, we reach "White Rock City."

History.

It is but recently that vein mining has been prosecuted in this locality. The district was discovered and brought into notice by Mr. Stephen Sherwood, a '49er frontiersman, and inveterate prospector, who, like the Wandering Jew, drifted from place to place in search of new discoveries, fresher fields and fairer flowers. He discovered Meadow Valley, Pioche, and many other valuable districts. While in the vicinity of Shasta, this mineral belt attracted his attention. He followed it, until he camped in what is now known as the New River district, exclaiming, "Eureka." He made some locations, communicated his find to his friends, prospectors came in, and with them Messrs. Clement, Clifford and Ladd. They discovered or purchased the Mountain Boomer, built an arastra, and in a short time ground out $11,000, with a profit over all expenses of $8,000. The inhabitants of the lumber region of Humboldt county heard of the strike. They exchanged their saws and axes for picks and shovels, and came in by hundreds. They took the place by storm, formed a district and commenced prospecting. They soon discovered veins of quartz, made locations, of which quite a number have developed into valuable mines. The map accompanying this article contains, of the hundreds of locations, only such as have been surveyed, giving but a faint idea of the actual number. Many of the unsurveyed locations have great apparent values, and new mines are daily being discovered.

Some of the Mines.

The following is a description in brief, of such mines as Mr. Crossman examined, while in the district:

The Mountain Boomer—Evidently a slide—rock not in place; ore pays in arastra, $120 per ton; difficult to separate from the debris; incline 20 feet and shaft 12 feet.

Hard Tack—Situated 200 feet above the trail, strike a few points north of east; vein 15 inches; average assay of ore $194.16 per ton; shaft 62 feet deep; drifts at bottom 30 feet; now stoping quartz said to average in arastra $200 per ton; select samples paid 20 cents per pound.

Ridgeway—Tunnel 100 feet in vein (an adit); vein 20 inches; this mine is a westerly extension of the Hard Tack, and prospects the same; since examination a winze has been sunk; at end of adit vein much larger, and are fabulously rich; there are several other locations on this vein that prospect well.

Tough Nut—2,200 feet south and parallel with Hard Tack; ledge 16 inches; ore will average $100 per ton; adit level following vein 50 ft. Gutson Mine—Below Hard Tack; adit level 50 feet; 2-foot ledge; $50 rock.

Nevada—Situated on Slide creek, below trail; vein 15 inches; assays average $105.50; shaft 4 feet.

Yankee Boy—Strike east and west; vein from 3 inches to 20; average value $40 per ton; crosscut to ledge 200 feet; shaft 7 feet; 5-stamp mill, 250 pounds each; power, water.

Anchor—Situated on Battle creek; 2,000 feet below Yankee Boy; 15-inch ledge; $115 rock; shaft four feet.

Armstrong, No. 2—On Battle creek; 1,000 feet below Yankee Boy; 4-foot vein; course northwest and southeast; crops boldly, and assays $75 per ton.

Hunter—Below "White Rock;" vein sixteen inches; course east and west; dip forty-five degrees north; developed by several open cuts, 200 feet apart; can work by adit on vein; ore by assay gives an average of $56; select $300 per ton.

Hachunuc—Extension, and same as Hunter Extension—Same; these three mines can be all worked from one adit with 1,000 feet backs.

Sherwood—Small vein; well prospected by incline 130 deep and drift 20 feet, with several other openings and cut; assays $36 average.

Live Oak—An extension; situated below Marysville; 2-foot ledge; average assays $75; course northwest and southwest; 50 foot adit level on vein.

Mary Blaine—Situated on a bald peak; altitude 5,000 feet, commanding view of Shasta peak and other points of note; strong vein in talcose slate, carrying quartz; strata rich; incline shaft 30 feet; 5 stamp mill, 250 pounds each, and a sawmill; power, steam.

Armstrong No. 1—Three locations, below Mary Blaine; but little work; course northwest and southwest; ledge 15 inches to 24; shows free gold in rock.

Potato Hill—A number of locations; recent discoveries; veins said to be six feet thick, showing gold freely.

Pony Creek—Report says that the ledges are from two to three feet thick.

Mining Assessments in 1884.

During the year 1884 some 210 assessments have become delinquent on 120 mines in California, Nevada, Utah, Alaska, Arizona, Lower California and Mexico, all of which are incorporated under the laws of California. The aggregate amount of these 210 assessments is $4,724,700. During the year 1883 the number of assessments becoming delinquent was 235 on 148 mines, aggregating $5,885,800. This is the amount levied. The actual sum collected is another thing. Of the amount levied in 1883, the Noonday, North Noonday and Red Cloud mines each levied $100,000, making $300,000, not a dollar of which was paid. There were probably many other cases where only a portion of the amount levied was collected. It is impracticable to get at the actual amount collected in any one year. The best that can be done is to give approximate figures. In former years, when people promptly paid their assessments, the returns were more reliable, as the collections corresponded more closely with the levies. Probably more assessments have gone by default this year, in proportion to the amount levied, than in any previous year.

The *Bulletin* sums up the assessment situation as follows: Four assessments have become delinquent on the California mine this year and one on the Consolidated Virginia mine. Each of these was at the rate of 20 cents per share, and each of the assessments, had all the shares been assessed, would have made $108,000, or $540,000 in all. But, on inquiry at the offices of these companies, we find, that owing to the large amount of stock forfeited, the Consolidated Virginia assessment amounted to only $93,000 and the California assessments to $34,000 apiece, so that instead of $540,000 from the above five assessments, the amount collected was only $259,000. The corrected figures appear in our list. This is probably the worst case on the Comstock. Most of the other Comstock mines collected nearly all the amount levied. Last October the California and Consolidated Virginia mines were consolidated under the name of the Consolidated California and Virginia Mining Company with a capital of $21,600,000 in 216,000 shares, in place of $103,000,000 in 1,080,000 shares. The new corporation levied its first assessment of 30c per share on the 5th of November. This assessment became delinquent in the office on the 10th of December. All the old stock has not been transferred to the new organization, but a considerable part of the assessment has been paid.

The Northern Belle presents even a sadder case than the one just considered. This mine is in Esmeralda county, Nevada. It was a good mine from the start—that is, it was opened and placed on a dividend-paying basis without cost to stockholders. It kept up its disbursements to stockholders for several years. The last dividend was paid in March, 1883. This was the seventieth dividend, and made a total of $2,530,000. Indications of trouble were even then apparent. The Holmes Mining Company commenced a suit against the Northern Belle and obtained a judgment of $400,000. On the 3d of November, 1883, the Northern Belle levied its first assessment of 50c per share, or $25,000. Very little of the assessment was paid. On the third of January, 1884, a second assessment of $8 per share was levied, aggregating $400,000, the largest mining assessment ever levied. This was to satisfy the judgment of the Court in favor of the Holmes Company. Subsequently the Holmes Company took 700 shares of the stock, together with the Northern Belle mine and all the property connected therewith, releasing at the same time the directors and all the stockholders from all liability for the judgment of $400,000 awarded by the Court. Neither of these assessments will be found in our list, though both became delinquent. It is possible there may be some other assessments that ought to be ruled out for similar reasons, though the aggregate amount thus involved would hardly make as large a sum as that we have already eliminated. It is probable that nearly $4,000,000 of $4,724,700 listed herewith has been collected. The names of the mines on which assessments have become delinquent in 1884 are as follows:

Acme Mill	$8,000	Jupiter D. Gravel	10,000
Alaska	35,000	Justice	26,250
Alaska Mill	3,400	Lady Wash. Con	10,800
Alpha Consolidated	45,000	La Grange Hyd	5,000
Alpha Hydraulic	7,500	Lake Co. Quicksilver	6,250
Andes	27,500	Lewis Consolidated	3,000
Alta Consolidated	162,000	Loretto Mill	20,000
Argenta	10,000	Mammoth Bar	45,000
Antiman Mill	2,000	Marshall	3,000
Baker Divide	2,000	Martin White	34,500
Belmont	25,000	Massachusetts Cor	1,000
Belle Isle	35,000	May flower Gravel	32,500
Benton	48,600	Mexican	226,000
Best & Belcher	216,000	McElroy Gravel	3,000
Blue Bluff Gravel	2,000	Milton W. & Gravel	75,000
Bodie Consolidated	50,000	Morrell Con	1,000
Bodie Tunnel	20,000	Mono	25,000
Bullion	25,000	Mono Lake Hyd	10,000
Butte Creek	2,000	Morgan	16,000
Caborca	15,000	Murchie	15,000
California	136,000	New Coso	4,000
Champion (Mono Co.)	15,000	New York Hill	30,000
Champion (New Co.)	11,100	North Belle Isle	10,000
Christy	00,000	N. Gould & Curry	37,500
Chollar	108,000	North Peer	2,000
Columbus Con	25,000	Oleta	1,000
Con. Amador	15,000	Ophir	201,000
Con. Imperial	50,000	Overman	28,800
Con. Virginia	93,000	Pedro Consolidated	5,000
Con. Cal. & Vir	64,800	Peer	20,000
Copperopolis	5,000	Peerless	50,000
Crocker	25,000	Pinal Consolidated	10,000
Cueva Santa	30,000	Pittsburg	25,000
Day	105,000	Pleasant Valley	10,000
Dayton	40,000	Potosi	140,000
Delaware	5,000	Rainbow	45,000
Diana	10,000	Red Hill Hydraulic	5,000
Eastern Quicksilver	5,000	Real de la Castillio	2,000
Eintracht Gravel	15,000	Santa Ana	3,000
El Capitan	3,000	S. Miguel & La Trin.	50,000
El Dorado Con	15,000	Savage	224,000
El Dorado S. Con	50,000	Segregated Belcher	9,400
Elko Consolidated	30,000	Sierra Nevada	250,000
Enterprise Mill	3,000	Silver Hill	5,400
Equitable Tunnel	8,000	Scorpion	20,000
Eureka Con	50,000	Solid Silver	5,000
Exchequer	20,000	Standard Con	25,500
Excelsior Gravel	100,000	Starlight	6,000
Golden C. Drift	3,000	Sterling	1,000
Golden Fleece G	21,500	Summers Con	2,500
Goodshaw	10,000	Summit	2,500
Gould & Curry	162,000	Telfair	2,500
Grand Prize	80,000	Tilden	5,000
Hale & Norcross	190,000	Tohongo	3,000
Head Center Con	10,000	Union Consolidated	250,000
Holmes	100,000	Union Gravel	5,000
Humboldt Hill	3,000	Utah	70,000
Independence	40,000	Villagrana	2,000
Indian Springs D	14,000	Wall St. Quicksilver	9,000
Julia Consolidated	11,000	Wildman	2,500

It will be noticed that the number of assessments varies from 1 to 6, and the amount of the levies from $1,000 to $250,000. The Sierra Nevada and Union Consolidated have each levied $250,000 this year. The levies may be apportioned as follows:

CALIFORNIA.

Counties.	Amount.	Counties.	Amount.
Amador	$22,500	Los Angeles	$3,000
Butte	24,000	Mono	160,000
Calaveras	32,000	Nevada	172,000
El Dorado	22,000	Placer	103,600
Fresno	1,000	Sierra	95,000
Inyo	4,000	Stanislaus	5,000
Lake	20,250	Yuba	100,000
Total			$764,350

NEVADA.

Counties.	Amount.	Counties.	Amount.
Elko	$215,000	Lyon	$10,000
Esmeralda	130,000	Nye	105,000
Eureka	68,000	Storey	2,932,450
Humboldt	3,000	White	34,500
Lincoln	165,000		
Total			$3,632,950

ARIZONA.

Counties.	Amount.	Counties.	Amount.
Cochise	$20,000	Pima	$102,000
Cila	2,000	Pinal	13,000
Total			$137,000

UTAH.

Salt Lake county	$8,000
Washington	60,000
Total	$68,000

ALASKA.

Douglas Island	$3,400

LOWER CALIFORNIA.

Real de la Castillio	$2,000
Villagrana	2,000
Total	$4,000

MEXICO.

Chihuahua	$50,000
Sinaloa	45,000
Sonora	20,000
Total	$115,000

These amounts compare as follows with those delinquent in the previous year:

	1883.	1884.
California	$1,196,044	$764,350
Nevada	4,244,490	3,632,950
Arizona	165,500	137,000
Utah	52,000	68,000
Dakota	10,000	.....
Alaska	20,250	3,400
Lower California	4,500	4,000
Mexico	193,000	115,000
Total	$5,885,784	$4,724,700

Deducting $300,000 levied by three Mono county mines in 1883, but not collected, and there is but little difference in the tables for the two years for California. Nevada has levied $800,000 less than in 1883. Storey county has called for much more money this year than the bullion produced in that county has sold for. As there have been no dividends from that county, except the small amount paid by the Kentuck, it has required the value of the bullion and all the assessments collected to keep the mines there open and allow the work of searching for ore to proceed.

Gold and Silver in San Francisco.

Assistant United States Treasurer Spaulding, of this city, reports the following money in the Government vaults under his control at the close of business on the last day of December, 1884:

Gold coin	$56,002,600
Standard dollars	19,336,000
Fractional silver coin	7,887,655
Paper money	5,080,000
Nickels	16,000
Total	$88,321,655

This amount is about $100,000 in excess of the total at the close of November, and is the largest amount ever reported at this institution at the close of any month. There was a gain of $1,370,000 in gold coin in the month of December, most of which was for New York account, and was represented by silver certificates forwarded instead of coin. There was also a small increase in other metallic money, but a decrease of $1,630,000 in paper money, mostly silver certificates.

The cash balance in the Sub-Treasury at the commencement of business on the first day of each month this year compares as follows:

January 1st	$72,197,188
February 1st	72,420,567
March 1st	75,650,556
April 1st	81,841,109
May 1st	82,230,000
June 1st	82,727,417
July 1st	82,872,311
August 1st	83,124,553
September 1st	82,552,906
October 1st	82,092,798
November 1st	88,102,790
December 1st	88,220,384
December 31st	88,321,655

There has been a gain during the year of $16,124,467, as follows:

Gain in gold coin	$16,539,000
Gain in silver coin	2,767,467
Total gain	$19,506,467
Decline in paper money and nickels	3,382,000
Net gain in 1884	$16,124,467

The United States Mint in this city coined $20,447,500 in gold in 1884. Most of this, as will be seen above, found lodgment with the Assistant United States Treasurer of this city, and very largely in exchange for coin certificates, which certificates were forwarded to New York in lieu of sending gold. By this means the bankers and merchants economized something in the way of exchange. The disposition of the gold coin made at the local Mint last year may be disposed of as follows:

Coined in 1884		$20,447,500
Paid in at Sub-Treasury	$19,539,000	
Sent out in mails	1,330,800	
Sent out regular way	1,310,200	
		19,230,000
Added to local circulation		$1,217,500

Economical Ore Reduction.

On Friday of last week there were about 2,000 tons of ore in cars at the works of the Omaha and Grant Smelting Company, in this city. Fully as much more is in stock. This ore is drawn from all the various camps in the State, as well as outside localities, and hence embraces all grades and varieties rich enough to bear the cost of transportation and smelting treatment. Gold, silver, lead and copper ores are represented in both desirable and refractory combinations. The Grant works, and in fact all the large works of the valley towns, are fully abreast with all the latest improvements and methods for economical ore reduction, and are the competitors of all process workers, with the difference that they buy and reduce in bulk instead of test lots. These large smelting plants do not employ similar devices, but they save values as closely and economically, while doing a much larger business than all the process men combined. The skillful combination of the various ores permits the free smelting of a large per cent of refractory ores without a preliminary roasting. One bed was pointed out which contained 65 tons of Mary Murphy ore, which was so distributed and combined with desirable ores that the product will smelt as readily as a straight Leadville or Battle Mountain carbonate of lead product. This Murphy ore is not objectionable to these large establishments, because they have the facilities as well as the skill for mixing and smelting, without being obliged always to give it preliminary roasting. Fine concentrates and powdered mill tailings are roasted for 24 hours, and then raked into an adjoining furnace and melted into slag, which, after cooling and being broken up, is in fine shape for the water-jacket furnace. This treatment requires about 27 hours, is cheaply performed, and, while preventing the loss that would occur if fed in original form into a blast furnace, is converted into a most desirable product, whose every value is retained. Is is questionable whether the owners of the Mary Murphy mine will build works of their own near that property, as has been currently reported, because a trial has shown that the ore can be sold to fully as great advantage to owners as their own private works could achieve. Such a decision on the part of the Mary Murphy Company, after two years of experimenting with special processes, would be a strong testimonial to the efficiency and progress of the established and legitimate smelting works as compared with special processes. Another feature distinguishes such works as the Omaha and Grant smelters—their furnaces are operated day and night, for months at a time, without cessation, and one furnace was not entirely cooled for a period of 18 months. This record is in marked contrast to the weekly or monthly "blow outs" of small works everywhere.

Of course, good and sufficient reasons may be shown for the interrupted campaigns of small and new works, but a mine having a large output desires to patronize works where "these good and sufficient reasons" for irregular operation do not occur. The immense output of the State necessitates steady and continuous work by smelting furnaces to give stability to market values, and it should be remembered to the credit of our Leadville, Pueblo, Denver and Golden smelters that they have not retarded mining operations by either insufficient capacity or lack of funds to pay cash for ores.

These establishments have steadily enlarged their capacities to meet the requirements of increased ore production, have supplied the necessary capital and have met all competition in a fair field without resort to efforts to crush out a single weak competitive process. The smelters have neither cut down wages nor advanced prices of treatment to a point which has caused any reasonable and well-posted miner to complain. Though silver and lead have declined to a degree never before experienced, the smelters have borne the brunt of the decline, and have sought relief in greater metallurgical skill and the closing of every avenue for the escape of values in the ore while it is undergoing treatment.

Notwithstanding the fact that silver and lead have greatly fallen in price, and many mines are idle in consequence, there is less of harsh criticism and a better feeling between miners and smelters than was ever the case in our mining history. The sagacity of our smelters has equaled their skill, for notwithstanding the immense values locked up in bullion and held for months upon a falling market, they have managed their deliveries so as not to bear the market and yet to realize without bankruptcy to themselves. This is no inconsiderable feature to observe in the conduct of a business of such magnitude, and when viewed in a comprehensive light, including all details, reflects the highest credit upon the skill and sagacity of all those gentlemen engaged in the enterprises of ore reduction on a large scale in the State of Colorado.—*Denver Tribune-Republican.*

UTAH'S MINERAL PRODUCT, 1884.

Wells, Fargo & Co's Statement of the Mineral Product of Utah for 1884.

BASE BULLION.	LBS. LEAD, REFINED.	LBS. LEAD, UNREFINED.	OZS. FINE SILVER.	OZS. FINE GOLD.
Germania Lead Works	4,840,987	1,513,455	60,264	202
Hanauer		12,390,865	651,099	2,138
Horn Silver Mining Co		22,380,027	1,435,606	
Mingo Furnace Co		11,860,466	326,579	1,111
Net Product Base Bullion	4,840,987	48,144,793	2,474,238	3,541
Lead, Silver and Gold in Ores shipped		7,879,100	776,421	205
Matte containing Copper	63,372 lbs.		3,325	
Total Base Bullion and Ores	63,372 lbs.	56,023,893	3,253,984	3,806
DORE BARS.				
Germania Lead Works			283,982	685
Ontario Silver Mining Co			1,879,567	
Silver Reef District			234,563	
Other Mills and Places			17,392	1,039
Total Dore Bars			2,415,504	1,724

RECAPITULATION.

4,840,987 lbs. Refined Lead, at 3½ cents per lb	$ 169,434.54
56,023,893 lbs. Unrefined Lead, at $35 per ton	980,418.12
5,669,488 ozs. Fine Silver, at $1.08 per oz	6,123,047.04
5,530 ozs. Fine Gold, at $20 per oz	110,600.00
63,372 lbs. Copper, at 10 cents per lb	6,337.20
Total Export Value	$7,389,836.90

Computing the Gold and Silver at its mint valuation, and other metals at their value at the seaboard, it would increase the value of the product to $9,301,508.

Comparative Statement, showing the quantity of the Silver and Gold contained in base bullion produced in Utah:

YEAR.	Total Ounces of Silver Produced.	Total Ounces of Gold Produced.	Ounces of Silver in Base Bullion.	Ounces of Gold in Base Bullion.	Per Cent of Total Silver Product	Per Cent of Total Gold Product.
1877	4,359,703	17,325	2,102,008	11,035	48.2-10	63.6-10
1878	4,367,328	15,040	2,108,329	10,105	48.3-10	67.5-10
1879	3,835,047	15,932	1,797,589	5,623	46.8-10	35.7-10
1880	3,783,566	8,020	1,403,819	2,878	37.1-10	35.8-10
1881	5,400,191	7,958	2,643,899	2,622	48.9-10	32.9-10
1882	5,435,444	9,039	2,581,789	5,016	47.3-10	55.5-10
1883	4,531,763	6,991	2,351,190	5,597	51.8-10	80
1884	5,669,488	5,530	3,253,984	3,800	57 4-10	68.8-10

Comparative statement of the value of lead bullion, including silver and gold necessarily produced in its manufacture West of the Missouri River, compiled from the annual reports issued by John J. Valentine, Vice-President and General Manager, Wells, Fargo & Co., San Francisco.

YEAR.	Total Value of Precious Metals, including Lead.	Total Value of Lead Bullion, including Gold and Silver Contents.	Per Cent of Entire Product.
1878	$31,154,622	$14,740,581	18.1-10
1879	75,349,501	19,234,394	25.5-10
1880	80,167,936	28,114,564	35
1881	84,804,417	30,253,430	35.8-10
1882	92,411,835	35,798,750	38.7-10
1883	90,313,612	34,810,022	38.5-10

Nevada at the Exposition.

The New Orleans *Times-Democrat* has the following to say in regard to the Nevada exhibit at the big Exposition: The exhibit from this State is now well under way and already presents features of surprising interest. It was to be expected that a State containing the great Comstock lode, a State which can boast of the Sutro tunnel, a State, the mineral resources of which have enabled Mackay, Flood and O'Brien and the other "bonanza kings" to amass their enormous fortunes—it was to be expected that such a State should send an unequalled collection of minerals and ores. But it is with some surprise that one sees in the midst of the exhibit from Nevada specimens of the cotton plant bearing cotton equal to that of the sea-island plantations, potatoes weighing more than four pounds, apples rivaling the finest shown in the collection of any fruit-growing State. It is there that the impartial observer may be excused if his enthusiasm becomes unbounded. However, notwithstanding the excellence of the agricultural display, the main feature of the exhibit is the collection of minerals and photographs relating to the great mining industries of the State. The State Commissioner is Colonel C. C. Thomas, the superintendent of the far-famed Sutro tunnel, and it is to his energy, unaided by any State appropriations, that Nevada owes this magnificent exposition of her resources. The collection is made of specimens from a large number of Nevada mines and several line collections from private cabinets, notably those of Senator Jones, J. Shaw, S. Dowling, the State cabinet, the cabinet of the Pacific Coast Pioneers, an organization made up of 49ers, and W. M. Havenor, who will remain here in charge of the display. The collection is a large one, well classified and labeled.

Specimens of ore are shown which assay at $20,000 to the ton. Large photographs on the wall present vividly some of the picturesque localities of Nevada and views of the more prominent mines. The original drawings of the great Sutro tunnel are also displayed. This marvelous feat of engineering consists of a tunnel eight miles in length, driven into the side of a mountain at a depth of 1,600 to 1,700 feet. The diameter varies from eight to sixteen feet. This tunnel was driven for the purpose of draining the numerous mines clustering around the great Comstock lode. The yield of these mines and the fortunes amassed by their owners are almost beyond computation. But for this tunnel they would to day be useless. The tunnel itself is no mean source of income to the members of the corporation maintaining it. The method of payment adopted is to collect from each mine drained $1 for each ton of ore taken out and yielding less than $30, and $2 in case the yield is more than $30.

The Salt Lake Ore Market.

S. W. Eccles, General Traffic Manager of the D. & R. G. Western, has returned to Utah from his Eastern trip. Mr. Eccles has been absent about a month, and has attended pool meetings in Chicago and New York. A Salt Lake *Chronicle* representative button-holed him in the D. & R. G. office the other morning, and proceeded to quiz him on the work done at these meetings.

"Was there anything done in Chicago that will in any way affect Utah traffic?"

"Yes; we did one thing that will be of great benefit to Salt Lake. That was raising the rates on all ore from Utah, east and west. The rate heretofore has been $6.40 to San Francisco, Pueblo and Denver, and under those rates, a good deal of ore has gone out of the Territory, especially to Colorado. At the pool meeting, in Chicago, the rate to each of the points was raised to $10. This, I think, will result in forcing all Utah ore into the Salt Lake market."

"This change does not affect the rates to Omaha and Kansas City?"

"No; but a greater part of the ore sent out of the Territory has gone to Pueblo and Denver. That will come to Salt Lake now."

"Nothing was done, of course, in relation to the Union Pacific's discrimination on Wood River ore?"

"No; that is local business. When the question of favoring Salt Lake, by raising the rates on outward bound ore was before the meeting, I suggested the propriety and justice of extending the policy to Wood River ores, but was politely informed that was none of my —— business.'"

"Is there any foundation for the report that the Utah Traffic Association will go to pieces?"

"None at all. The Traffic Association was formed for an indefinite period. Under the articles of agreement, any road can withdraw from it whenever it sees fit, by giving 90 days' notice of its intentions."

Whether the increase of rates on ore shipped to outside points will be a benefit to Salt Lake or the Territory, is questionable. It is true that the shipments of ore from this city, east and west, averages about 50 carloads per week, but a greater part of it is of such a refractory nature, that it cannot be profitably treated at the Utah smelters.

USEFUL INFORMATION.

New Applications of Paper.

Wm. J. Griffin, of the Holyoke envelope works, says the *Transcript* of that town, has invented a new application of paper. It is designed as a substitute for wood in blocks or bars, wherever a knife is used in a mechanical cutter. In the shape of bars it has been put into every paper mill in his district, where an undercut cutter is used. The Whiting, Albion, Winona, Nonotuck, Massasoit, and other mills have it. The invention is also applied to blocks for shoe cutting and cigar making. At the Holyoke envelope works it is used in the cutting blocks in the envelope cutters. One outlasts a dozen of the formerly used wooden blocks. In its manufacture, sheets of paper are compressed by enormous force into blocks or bars, as wished, harder than wood and far more durable. Mr. Griffin has just received his patents on the invention, and will now introduce them outside of Holyoke.

Still Another New Application.

Papier mache process for covering floors is described as follows: The floor is thoroughly cleaned. The holes and cracks are then filled with paper putty, made by soaking newspaper in a paste made of wheat, flour, water and ground alum, as follows: To one pound of flour add three quarts of water and a tablespoonful of ground alum, and mix this thoroughly. The floor is then coated with this paste, and a thickness of Manilla or hardware paper is next put on. If two layers are desired, a second covering of Manilla paper is put on. This is allowed to dry thoroughly. The Manilla paper is then covered with paste, and a layer of wall paper of any style or design desired is put on. After allowing this to thoroughly dry, it is covered with two or more coats of sizing, made by dissolving one-half pound of white glue in two quarts of hot water. After this is dry, the surface is given one coat of "hard oil finish varnish." This is allowed to dry thoroughly, when the floor is ready for use. The process is durable and cheap, and, besides taking the place of matting, carpet, oil cloths, etc., a floor thus treated is rendered airtight, and can be washed or scrubbed.

TO TAKE OUT MILK AND COFFEE STAINS.—These stains are very difficult to remove, especially from light-colored and finely-finished goods. From woolen and mixed fabrics they are taken out by moistening them with a mixture of one part glycerine, nine parts water, and one-half part aqua ammonia. This mixture is applied to the goods by means of a brush, and allowed to remain 12 hours, occasionally renewing the moistening. After this time, the strained pieces are pressed between cloth and then rubbed with a clean rag. Drying, and, if possible, a little steaming, are generally sufficient to thoroughly remove the stains. Stains on silk garments which are dyed with delicate colors or finely finished are more difficult to remove. In this case five parts glycerine are mixed with five parts water, and one-quarter part of ammonia added. Before using this mixture it should be tried on some part of the garments where it cannot be noticed, in order to see if the mixture will change color. If such is the case, no ammonia should be added. If, on the contrary, no change takes place, of if, after drying, the original color is restored, the above mixture is applied with a soft brush, allowing it to remain on the stains for six or eight hours, and is then rubbed with a clean cloth. The remaining dry substance is then carefully taken off by means of a knife. The injured places are now brushed over with clean water, pressed between cloths and dried. If the stain is not then removed, a rubbing with dry bread will easily take it off. To restore the finish, a thin solution of gum arabic (or in many cases beer is preferred) is brushed on, then dried and carefully ironed. By careful manipulation the stains will be successfully removed.

ONLY ONE TRUE DISINFECTANT.—Prof. de Chanmont says, with regard to disinfectants, that there is but one true disinfectant, viz., fire. The majority of so-called disinfectants are simply deodorants. The idea that tobacco smoke or the odor of camphor is destructive of contagion is still extensively held, though it is simply absurd. A true disinfectant is a substance that will kill the germ or living particle in which the contagious principle resides or through which it is conveyed. Of true disinfectants, heat is the most reliable, though odors are not to be despised, such as carbolic acid, chlorine and sulphuric gas.

EDITORS PRESS:—I notice in a late number of your paper a method of finding the height of a tree by means of a stick and circle. The following seems to be a shorter and simpler way: Place a stick of convenient length upright in the ground and measure the length above ground. Measure the shadow of the stick and that of the tree. As the length of the shadow of the stick is to the length of the stick so will the length of the shadow of the tree be to the height of the tree.

THE STORMY PETREL possesses a very large amount of oil, which, when terrified, it has the power of throwing from its mouth. In the Faroe islands the people draw a wick through its body, when it is young and fat, and, lighting the end that projects from the beak, use it for a lamp. It will burn for a long time.

ANTIQUITY OF TRADE MARKS. A foreign cotemporary has discovered that trade-marks are nearly as old as the industry of the human race. Ancient Babylon had property symbols, and the Chinese claim to have had trade-marks one thousand years before Christ. Gutenburg, the inventor of printing, had a lawsuit about a trade-mark and won it. As early as 1300 the English parliament authorized trade-marks, and the laws of America also protected them. Extraordinary means have been required at all times to guard against the fraudulent use of marks of manufacturers. If we have no means of identifying the trade-mark, the best goods at once lose their value. This was early discovered, and probably the successors of Tubal Cain were the first to use distinctive marks on their productions.

ANCIENT TOOLS.—The modern tool makers give employment to a high degree of mechanical skill, and much metallurgical knowledge is requisite for the selection of material to make first class tools. But when we reflect on the difficulties these ancient tool makers had to surmount, in fastening and retaining stones as cutters on a base of bronze, we can appreciate the perfection which their art reached. They probably followed methods of hardening copper alloys which are not known to us and are not discovered by modern metal workers, because the knowledge is not essential, but the real mystery of how clean cutting of hard substances was done in those times lay in the acquired skill of the tool makers.

THE annual statement of Wells, Fargo & Co. of the production of precious metals in the States and Territories west of the Missouri river, including British Columbia and receipts by express from the west coast of Mexico during 1884, shows aggregate products as follows: Gold, $26,256,542; silver, $45,799,069; copper, $6,086,252; lead, $6,834,091. Total gross yield, $84,975,954. California shows a decrease in gold of $944,703 and an increase of silver of $513,597. In Nevada the Comstock shows an increase of $1,668,524; Eureka district shows a decrease of $123,152, showing a total increase in the State of Nevada of $117,318. Montana shows a considerable increase; Colorado and Arizona show a decrease from the production of 1883.

THE Grand Prize mill started up Thursday night for the purpose of crushing the ore on hand at the time of the caving in of the roof, which will probably keep it busy of a couple of weeks.

GOOD HEALTH.

The Children's Hospital.

We vary the contents of our Good Health Column this week. Instead of pursuing our usual hints and suggestions for individual well-being and comfort, we give a sketch from the *Call* of an institution in our city which is doing a noble work for the little sufferers who without its aid would linger in misery or speedily perish. It is known as the Children's Hospital, on Thirteenth street. This institution was incorporated in March, 1875, under the name of the "Pacific Dispensary for Women and Children." Its object is fourfold: First, a dispensary where the sick poor can receive free treatment; second, to provide for women the medical aid of competent women physicians; third, a hospital for sick and crippled children; fourth, a training school for nurses.

The Dispensary and Hospital.

Of the dispensary it is only necessary to say that it furnishes medical and surgical treatment and medicine to over 200 women and children every month to show the place it fills and the misery it relieves. The Woman's Hospital has a double usefulness. It enables women who prefer to be treated by physicians of their own sex, and it enables these female physicians to demonstrate their fitness for the profession they have chosen, and to compete with men on equal terms. But while there are other dispensaries and hospitals for adults, this is the only Children's Hospital on the coast. An attempt was made some years ago to open a children's ward in St. Luke's Episcopal Hospital, but the scheme failed, and the whole institution was closed for lack of funds. The children's ward in the Pacific Dispensary occupies half of the double building at 221 and 223 Thirteenth street, near Folsom. Thither are sent the little sufferers from the Boys' and Girls' Aid Society, and its existence makes a "Society for the Prevention of Cruelty to Children" possible. These children are necessarily free patients, but those who are sent by their parents or under the advice of physicians pay according to their ability. It is a sorrowful commentary on paternal responsibility and maternal instinct that several times a sick child has been left at the hospital, a certain sum of money being paid in advance, and no further trace could ever be found of the people who took it there. It seemed as if the poor little ailing creatures were a burden too heavy to be carried any longer, and its natural protectors simply dropped it. There is nothing to do with such cases on recovery except to send them to the orphan asylum, unless some one adopts them. The hospital is no place for well children, and is only designed for sick ones.

Lights and Shadows.

Parting with the convalescents is one of the great griefs of physicians and nurses. To many of the little ones the hospital is the first home they have ever known—a place that will always be associated in their minds with memories of broth and wine, of lemonade and chicken, of soft clean beds and gentle kindness always, so that the pain is forgotten, and only the comfort and cleanliness remembered. There are now about 20 children at the dispensary. Of these, 6 are suffering from hip disease. The ages range from 2 to 11 years, though there is a young girl of 17, terribly crippled and distorted with inflammatory rheumatism, but she is so small and delicate in appearance that she looks like a child 10 years old. The two nurseries are pretty sunny rooms on the second floor, furnished with cribs and little low rocking chairs, besides the usual complement of lounges and invalid chairs. There is one little girl, about 5 years old, whose disease is water on the brain. The head is so abnormally large, that the child has never been able to walk, and is hopelessly imbecile. The boys far outnumber the girls, now and always. Whether it is that boys play in the street and are exposed to more dangerous accidents, or have more vitality, and resist diseases, to which girls succumb, the fact remains that the boys predominate. It was pitiful to see the sick babies in their cribs, and the older ones just able to get about on crutches, but the matron took a cheerful, hopeful view of every case, and said it would be dismissed—cured in six weeks or six months, according to its greater or less severity. She pointed out a little fellow who had undergone a painful operation a day or two before, which had engaged the attention of three physicians, but seeing a look of horror on the face of her interlocutor, she hastened to explain that the three physicians did not add to the magnitude of the operation, nor yet was it a case where, in a multitude of council, there is safety for the councilors; but that an operation, great or small, can scarcely be performed with less. One administers chloroform and watches the pulse, one actually performs the operation, and the third hands instruments, sponges, or bandages, as they are needed. The children who were not actually suffering, seemed very contented and happy. The Fruit and Flower Mission, and several church societies are very kind in sending them toys and pictures, as well as fruits and jellies. Their regular hours for meals are 7:30 A. M., 12:30 and 5:30 P. M., but it is at the discretion of the nurses to allow them a lunch, both morning and afternoon.

Training Nurses.

These nurses, eight in number, under the direction of a matron, are very attractive and interesting. They are not obliged to dress alike, except that all are required to wear white caps and aprons. One of the objects of the Hospital is to train nurses thoroughly. Very few know how much knowledge and practice are essential to good nursing, and perhaps an idea may be given by stating that this course of instruction covers two years, and includes the dressing of burns, sores and wounds, the preparation of fomentations, poultices and dressings, the best method of friction, the application of leeches and subsequent treatment, making bandages and rollers, lining splints, changing sheets while a patient is in bed, preparing food for the sick, securing proper ventilation, observing accurately the state of secretions, pulse, skin, sleep, etc. Besides this, there are lectures, recitations and demonstrations. This instruction is given mainly by the attending physician. The necessity for trained nurses is beginning to be felt everywhere. They relieve a physician of half his responsibility. The affectionate, misdirected zeal of many a young mother, who declares that no one shall touch her sick baby but herself, has lost precious lives that might just as well have been saved. A physician once dwelt with great bitterness on the death of a child from typhoid fever, as the family called it, though he insisted that the mother poisoned it as absolutely as if she had given it strychnine. He left the child entirely out of danger one day, and when he called on the next day, he saw that the case was hopeless. "What has this child eaten?" he asked. The mother hesitated a moment, and then said, "Doughnuts. He cried for them, and I thought, if he gets well it will be all right anyway, and if he does not, I should always reproach myself for refusing his last request." "Don't reproach yourself," said the doctor curtly. It would be hard to convince any mother that her sick children could be better cared for in the hospital than at home. It is true, nevertheless. They can be better nursed, better fed and better managed in every way. But if parents will not admit this, they ought at least to co-operate with a physician in efficient nursing. It is everything to him to know that his instructions will be carried out exactly.

The Sinews of War.

The Dispensary is at this moment terribly in need of funds. True, it was benefited both by the carnival and the Rosenthal exhibitions, but then its expenses are $600 a month for rent, supplies, laundry, drugs and appliances and salaries, and its income is only derived from the fees of paying patients, and a small sum from the State. The lease of buildings now occupied expires in April, and unless money can be raised to purchase or rent other quarters, the work must cease.

MINING AND SCIENTIFIC PRESS.

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DEWEY & CO., PATENT SOLICITORS.

A. T. DEWEY. W. B. EWER. G. H. STRONG

SAN FRANCISCO:

Saturday Morning, Jan 24, 1885.

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☞ *See Advertising Columns.*

Passing Events.

This number of the PRESS is mainly devoted to a review of tbe mining industry for the past year. It will well repay perusal by all interested in mining matters.

The great silver convention at Denver, Colorado, will be held in a few days, when subjects of great importance to silver miners will be discussed.

The caucus of the dominant party this week agreed to nominate ex-Governor Leland Stanford for U. S. Senator, from California, and this action will probably be ratified by the Legislature in dne course.

The winter still keeps many mines idle that in a few months will again be worked, and as few prospectors are abroad in the mountains at this season, few new discoveries are recorded.

The total amount of freight—coke, copper, bullion and supplies—handled for the Old Dominion Copper Company, of Arizona, for the year 1884, was 8,884 tons, or about 24½ tons per day throughout the year. The tonnage, although large, is but a tithe of what is would be if the company enjoyed the advantage of transportation by rail to Globe. They have it in contemplation, when rail connection is secured, to greatly increase the output of copper, which necessarily implies a corresponding increase in tbe consumption of coke, which now has to be hauled by wagon a distance of 130 miles, at a cost of $35 per ton.—*Silver Belt.*

MINING IN 1884.

A Review of Operations and Results.

A Summary of Important Doings in the Mining Regions Last Year.

Never have we addressed ourselves to the task of making our Annual Rsview of the mining interests of the Pacific Coast with more satisfaction than on the present occasion. And this, not because the past has been a year signalized hy the discovery of great honanzas, the occurrence of mining booms or any unusual activity in mining transactions of a speculative kind, nor yet, because outside capital has been seeking here investment to an unwonted degree. Our satisfaction is due to none of these, but rather to the fact that the past year has been marked by such absence of these meretricious attendants, feverish excitements and doubtful aids to the mining industry, as denote for the latter a more healthful condition and a more promising future than could ever beforc be justly claimed for it. As regards au active stock market and the old-frashioned craze, leading to senseless and hasty stampedes, such as have been so much the rule in former times, they have ever worked only harm to the best interests of mining, it being an open question if the finding of the so-called bonanzas have not had a like effect. In so far as California is concerned we are able now to develop our mines without tbe aid of foreign capital, there being little trouble in getting from home sources all the money required for opening up and equipping mining properties of genuine merit, and it would be a pity to sce money put into any other, even though obtained from people abroad. While our business men and capitalists are not so ready now as formerly to embark in any wild scheme that may be presented to them, they are quite as ready as ever to engage in mining enterprises, and they go about it with more deliberation and method, requiring, as they would if about to embark in any other legitimats business, assurances beforehand as to their fcasibility and merit.

The past year cannot be said to have been an exceedingly profitable one to the mining industry in general. Tbe low price of lead and copper, and the heavy discount on silver, have militated against profit in many mining operations. There have been no special mining excitements; and while a great deal of development has been going on, the summing up of general results has not proved as satisfactory in some quarters as bad been hoped. As regards this State, the double standard question having affected the silver mining industry, there has been a demand for gold mines, and it is probable that many old mines will be reopened and new ones developed within the next year.

Before considering ths different regions it will be well to pay some attention to the statistics of bullion productions. The figures compiled by Mr. Valentine, of Wells, Fargo & Co., are generally considered the most reliable, and we give bis report as follows:

The Bullion Yield.

DEAR SIR: The following is a copy of our Annual Statement of precious Metals produced in the States and Territories west of the Missouri River (including British Colnmbia, and receipts by express from the West Coast States of Mexico), during 1884, which shows aggregats products as follows: Gold, $26,256,542; Silver, $45,799,069; Copper, $6,086,252; Lead, $6,834,091. Total gross result, $84,975,954.

California shows a decrease in Gold of $944,703, and an increase of Silver of $513,597. In Nevada, the Comstock shows an increase of $1,668,524; Eureka District shows a decrease of $123,152. In the total product of the State there is an increase of $117,318; Montana shows a considerable increase; Colorado and Arizona a decrease from the production of 1883.

As stated hitherto, the facilities afforded for the transportation of bullion, ores, and base metals, by the extension of railroads into mining districts, increase the difficulty of verifying the reports of the products from several important localities; and the general tendeucy is to exaggeration when the actual values are not obtainable from authentic sources; but the aggregate result, as shown herein, we think may be relied on with reasonable confidence as approximately correct:

STATES AND TERRITORIES.	Gold Dust and Bullion by Express...	Gold Dust and Bullion by other conveyances.....	Silver Bullion by Express.....	Ores and Base Bullion by Freight...	Total.....
California.....	$12,232,471	$614,123	$1,504,705	$ 871,639	$15,272,938
Nevada.....	1,627,859	.....	5,005,304	1,455,776	8,888,939
Oregon.....	305,313	184,167	.....	.....	555,167
Washington.....	45,994	22,982	2,695	.....	70,125
Alaska.....	35,014	90,000	1,179	.....	126,193
Idaho.....	1,076,077	150,000	.....	315,100	1,541,177
Montana.....	1,876,700	.....	6,172,000	3,812,000	11,860,700
Utah.....	31,501	4,134	2,657,964	4,697,147	7,390,836
Colorado.....	2,575,861	.....	4,877,838	12,780,000	20,233,749
New Mexico.....	157,688	90,000	900,248	2,530,678	3,678,014
Arizona.....	390,701	100,000	3,139,628	3,455,980	7,056,379
Dakota.....	2,720,847	130,000	110,009	.....	2,930,847
Mexico(West Coast States)	235,256	.....	2,257,144	12,000	2,554,400
British Columbia.....	047,719	140,000	.....	.....	787,719
Totals.....	$23,930,303	$1,505,396	$28,343,945	$31,191,250	$84,975,954

The gross yield for 1884, shown above, segregated, is approximately as follows:

Gold, 30.90-100 per cent	$26,250,542
Silver, 53.90-100 per cent	45,799,069
Copper, 7.16-100 per cent	6,086,252
Lead, 8.04-100 per cent	6,834,091
Total	$84,975,954

ANNUAL PRODUCTS OF LEAD, COPPER, SILVER AND GOLD IN THE STATES AND TERRITORIES WEST OF THE MISSOURI RIVER, 1870-1884.

The Net Product of the States and Territories West of the Missouri River, exclusive of British Columbia and West Coast of Mexico, divided, is as follows:

Date.	Product as per W. F. & Co's Statements, including Amo'ts from B. C. and West Coast of Mexico.....	Product after deducting Am'nts from British Columbia and West Coast of Mexico.....	Lead.	Copper.	Silver.	Gold.
1870.	$54,000,009	$52,159,000	$1,080,000	.....	$17,320,000	$33,750,000
1871.	58,284,000	53,784,000	2,100,000	.....	19,289,000	34,395,000
1872.	62,236,959	60,351,824	2,250,000	.....	19,924,420	38,177,315
1873.	72,258,693	70,139,800	3,450,000	.....	27,383,302	39,216,558
1874.	74,401,945	71,905,610	3,900,000	.....	29,089,122	38,466,488
1875.	80,859,057	76,766,483	5,100,000	.....	31,035,239	40,631,244
1876.	90,429,753	85,811,689	5,085,250	.....	44,880,225	35,846,164
1877.	98,421,758	95,811,689	5,453,000	.....	37,248,137	37,676,039
1878.	81,154,022	78,276,167	4,135,799	.....	37,032,857	31,470,262
1879.	75,349,501	72,688,883	3,742,399	$ 598,000	38,033,055	32,559,067
1880.	80,167,936	77,292,512	6,681,902	1,195,000	42,987,613	30,953,959
1881.	84,504,417	81,198,474	8,003,155	4,055,037	48,133,089	29,911,318
1882.	92,411,535	89,207,549	8,103,550	5,683,921	42,975,101	25,183,567
1883.	99,313,612	94,689,212	6,834,091	6,086,252	45,799,069	26,256,542
1884.	84,975,954	81,683,835				

The exports of Silver during the past year to Japan, China, ths Straits, etc., have been as follows: From London, $40,221,658; from Marseilles, $1,361,250; from Venice, $130,680; from San Francisco, $13,903,990. Total, $55,617,578.

According to these tables, comparing the product of last year with that of the year before, the following countries have gained in the sums affixed to each: Nevada, $110,318; Washington Territory, $6,599; Alaska, $10,014; Montana, $1,983,000; Utah, $372,152; New Mexico, $247,095; Dakota, $163,847; British Columbia, $135,703; the following show losses in the sums named below: California, $400,326; Oregon, $37,813; Idaho, $3,542,177; Colorado, $4,076,251; Arizona, $1,127,364; West Coast Mexico, $2,667,984; showing a total decrease of $5,337,658 in the bullion product of 1884 as compared with that of 1883. That there should have occurred any decrease in the case of California and Idaho is a surprise to nearly every one. The falling off in Colorado was expected; so also it was known in advance that Arizona would fall behind, owing to tbe failure of some of the big mines at Tombstone. But after saying all this there will be no lack of parties ready to find fault with Mr. Valentine's returns, and in the case of California, there would seem to be some reason to question their entire accuracy. That tbe output of silver was in this State larger than the above table gives us credit for, can, we think, be clearly established. Tbe papers pnblished in San Bernardino claim that the silver produot of tbat county amounted last year to nearly $5,000,000. The Los Angeles *Times* of January 10th furnishes the following figures showing the output of certain mines and localities in San Bernardino county, with the remark, that these figures, though not official, will be found to be very nearly correct.

Here follows a list of the mines and their products for the year in the various districts:

King	$ 800,000
Sue mine	400,000
Occidental	60,000
Bismarck	360,000
Cuba	100,000
Silver Odessa	200,000
Garfield	300,000
Other Calico mines	1,000,000
Total Calico output	3,220,000
Bonanza King, Trojan District	600,000
Waterman Mine, Grapevine Dist	1,000,000
San Jacinto mine, Pinacate Dist	100,000
Other districts	500,000
Total output for the county	$ 5,420,000

After making due allowancs for the gold contained in this bullion, we have, according to the above showing, for this county alone nearly twice as much silver as Mr. Valentine assigns to the whole of California. Ssveral other counties in the State, as is well known, turned out some of this metal: Los Angeles, Alpine and Mono each a little, and Inyo a good deal. If we were to credit the sntire number with no more than a million dollars for ths year they would, no doubt, feel much aggrieved; yet this is far more than they took out. But canvassing the pros and cons as they seem to present themselves, ths silver product of California for the year last past could not have been much less tban $5,000,000.

We incline to the opinion that Mr. Valentine bas also somewbat underestimated the gold product of the State for thc year in question, this opinion having been formed, as in arriving at the product of silver, by taking the output of a few of the more prominent mines and districts as a guide. Thus, the shipments of gold from the town of Bodie amountsd for the year to over a million dollars, the output of each mine and locality in and about that town being given below:

Standard Con	$305,274 03
Bodie Con	617,939 49
Syndicate	171,049 56
New Standard	17,714 76
Bodie Tunnel	2,075 90
Wagner's Tailings Mill	17,600 00
Virginia Creek Hydraulic Co	21,300 00
Scattering	8,630 00
Bodie Ore	714 00
Total	$1,162,297 74

The total value of bullion, mostly gold, sent from that camp to.date amounting to about $17,000,000. The shipments of gold made during the year from ths following camps, mines and localities are estimated to have been as below stated: From the Slate Cresk Basin, $1,500,000; from Forrest City and vicinity, $1,000,000; from Nevada City and Grass Valley, $3,000,000; from the Forrest Hill Divide, $1,500,000; from the Empire mine, Amador county, $1,000,000, making from these few places $8,000,000, leaving only about $5,000,000 to be made up hy all the rest of the State, $2,000,000 less, probably, than was so produced. In looking over thc State there appears to have been some little increase at nearly all the principal mining ceuters; each small in itself, but tbe whole making a considerable aggregate of gains.

It has, we believe, been the practice of Mr. Valentine, to allow 10 per cent for tbe bullion transmitted otherwise than by express. While this allowance is ample as regards the carriage of silver, it is not enough in the case of gold, which, in considerable value, can be carrisd on tbe person without much inconvenience, the Chinese, of whom thers are now about 10,000 working on their own account in our placer mines, being notoriously addicted to this manner of transmitting their earnings to San Francisco. Greater security in traveling has tended to increase this habit also, among other classes of miners, wherefors it may be concluded that such allowance of 10 per cent is not at the present time large enough to represent the amount of gold that finds its way to the mint, or out of thc country, through private cbannels.

What Mr. Valentine says touching tbe increased difficulty of verifying his reports, by reason of the extension of railroads into many important mining districts, is entirely correct; his further remark, in regard to the general tendency to exaggeration, when actual values cannot be obtained from authentic sources, being equally true.

In tbis connection it should bs observed, that in estimating tbe bullion product of California, the term covers only gold and silver; whereas, in making such estimate for Arizona, Idaho, Montana, Utah, Colorado aud New Mexico, the value of the lead and copper produced is included in the bullion production of these countries. Of the $85,000,000 produced last year,

about 20 per cent consisted of gold, 53 of silver, 7 of copper and 8 of lead; that is, the value of the silver amounted to about 8 per cent more than the value of all the others combined.

CALIFORNIA.

So thoroughly have we learned the business, and so carefully is it now being practiced in California, that mining is quite as safe as viticulture, fruit or wheat growing; if, indeed, there do not attach to it elements of certainty that can hardly be claimed for either of these industries, seeing how dependent they are on the weather and the markets; how they are exposed to suffer from competition, and how heavily they are taxed between insurance, storage, commission and transportation charges, with none of which the miner has much to do.

From what has been said above it is not to be inferred that the past has been a year devoid of solid progress and valuable discoveries, for it has in reality been characterized by both to an eminent degree. But this progress has been made in a quiet, steady-going sort of way, while these discoveries have been of a kind not calculated to breed an excitement or attract general attention. Of the latter, California comes in for a large share, these finds, consisting of both gold and silver deposits, having occurred in all parts of the State. While causing no rushes or other premature movements, these discoveries have served to keep alive a healthy interest in the business of mining, while tending at the same time to renew confidence in the mineral resources of the State, which, though the oldest of all our mining countries, presents still the best field for exploration extant.

The Advantages that California Possesses as a Mining Country.

If not everywhere recognized abroad, are coming to be pretty well understood by her own people, who, after many trials in the adjacent countries and spending their hundreds of millions to little purpose, are content now to remain at home and devote their means and energies to developing the superabundant mineral wealth of their own State. This is a wise policy. The conditions here, in whatever light we view them, are infinitely superior to those that obtain among our immediate neighbors, or perhaps anywhere else in the world. First to be considered is our unrivaled climate, healthful, equable and invigorating; so mild, even in winter, that mining operations can be successfully pursued the year round in nearly all the mining districts of the State, these districts being, with hardly an exception, accessible by railroads or good wagon roads, over which freights and passengers are carried every day in the year, and at extremely low rates. There is not a mining district in California but what can be reached in three days' travel from San Francisco—only a few but what can be reached in less than half that time. A third of the California miners get the city papers the day they are published, and fully another third early the day following.

Another advantage pertaining to the mines of California is the fact that their product is mostly gold, a metal never without a market, for which in fact the demand is always in excess of supply, no matter how large the production made, and the price of which fluctuates but little. Twenty years ago, copper in this country was worth 50 cents per pound; to-day, it will hardly sell for ten. Only a few years since, borax was selling in all the markets of the world at 40 cents per pound; at present its average price is about eight cents. The price of quicksilver has within the past seven years fallen from $1.50 to 47 or 48 cents per pound, present ruling rates. Turning to the cultivators of the soil, we find that they have had an experience not unlike that of the copper, borax and quicksilver producers. The California farmer gets for his wheat only three-quarters, while the hop grower gets for his hops less than one-quarter the price they got two years ago; certain other agricultural products having depreciated nearly as much. Very different has it been with gold. The purchasing power of this metal, except as affected by the war, has remained throughout all these years about the same, nor is there any probability that it will suffer material change for many years to come. The gold miner, in so far as the price of his product is concerned, can count his gains and make his calculations with certainty.

The titles to mining properties of all kinds have, through long occupation and our admirable code of laws relating to the subject, become so well settled that they give rise now to little contention or litigation. For life and property there is at present as much security in the mining regions of this State as in any other part of the Republic, safety, law and order being the rule everywhere. Few labor strikes or other serious disturbances have ever occurred in our mines, none of late years, and yet labor is cheap and abundant, ruling rates of wages being not much more than in the agricultural districts. The earnings of miners who work their own claims are generally liberal, and sometimes quite large, but those who work on hire receive on an average not over $2.50, or at the most $3 per day, finding themselves.

That the metalliferous territory of California is ample it is needless to say. Her main gold and silver bearing belt has a length of 500 by an average breadth of 30 miles, this being apart from several detached districts of great extent. The entire mineral territory within the limits of the State comprises an area of hardly less than 30,000 square miles, affording room and verge sufficient for a vast expansion of the mining industry, and a corresponding increase of population.

By reason of the foregoing, not to mention a variety of minor advantages, such as improved processes and machinery, cheap fuel and lumber, absence of bullion taxes, etc., we are able in this State to mine and mill with profit gold-bearing quartz that yields under the stamps not over $2.50 per ton; and where water can be had for motive power, and all other conditions are exceptionally good, even lower-grade ore than this. Of two-dollar ore California contains illimitable quantities, there being here but few mines the output of which runs as low as that, the average of the ore worked in the State being between $6 and $8 per ton.

Before dismissing this branch of the subject it may be pertinent to observe that the mineral deposits of California are of such varied character and occur under such diverse conditions as render many different kinds of mining practicable, while they tend to greatly prolong the life of the business. Thus, we have in the category of the precious metals both gold and silver mines, the later occupying a broad range and carrying ores of both the milling and smelting varieties. Of gold we have also two principal classes of deposits, vein and placer, the latter being subdivided into many different kinds, according to their mode of occurrence or the means and methods employed in working them. The leading branches of mining in this department consist of hydraulic, drift and river-bed operations, beach and bar washing, booming, seam digging, etc., constituting minor branches of the business. Something is also done at rewashing the tailings that have accumulated in the river beds and along the ravines, an end generally effected by means of an open cut run below the deposits, and through which they can be run off. In no other country do the gold deposits occur under so many different forms as in California, nor do the natural facilities for working them exist elsewhere to the same extent as here. Little need have the inhabitants of this State to go outside its boundaries in search of mineral deposits or suitable opportunities for securing and working them.

Of the Mineral Discoveries Made in California During the Past Year

Although quite numerous, not more than a few, being such as have special significance, can be described or even more than alluded to in a review like the present, the scope of which must necessarily be very general. Conspicuous among these finds is that known as New River, a locality in the northwestern corner of Trinity county, where, according to well authenticated accounts, a series of rich, but not very large, gold bearing quartz lodes were found located and partially developed the past summer and autumn, the number having been increased as exploration has been extended up to the present time. We know how prone most men are to exaggerate and even willfully misrepresent the facts in a case of this kind, and therefore caution our readers against being misled by statements emanating from the over sanguine or self interested. But, while doing so, we incline to the belief that this New River discovery is really one of considerable magnitude, possibly one of the first importance. When, as in this instance, merchants, bankers, steamship and real estate owners, lumber manufacturers and other like substantial business men proceed in a quiet way to largely interest themselves in mines, most of them doing so only after personal inspection, the fact constitutes a strong argument in favor of their merit. These New River lodes have also been indorsed by many experts and practical miners, who have visited and examined them, and this, in so far as we know, without dissenting opinions. As not much exploration has been done the question of their permanence remains, of course, to be determined, there being no doubt as to their considerable number, tolerable good size and high grade ore. The geological formation is favorable and the climate a good one, the snow never falling to a greater depth than eight or ten inches, and hardly ever lying more than a week at a time, even in the severest winters. The district is well-watered and heavily timbered, but remains one of the few in California that are without wagon road communication with rail or navigable waters.

This deficiency will, however, soon be supplied, arrangements having been made for building a wagon road from Humboldt bay to the mines the coming spring.

Many other finds of auriferous quartz have been reported during the year as having occurred in various parts of the State, Shasta, Sierra, Placer, Calaveras, Nevada, Inyo and Kern counties being the sites of what seem to be the more important. Meantime, several rich silver bearing lodes have been found, mostly in the Calico and adjacent districts in San Bernardino county. Argentiferous veins carrying heavy bodies of ore have also been met with in Shasta county; and notwithstanding the ore here is extremely rebellious, the silver being combined with iron, copper, antimony and other refractory metals, there is little doubt but these veins will be extensively and profitably worked in the near future.

Hydraulic Mining.

Most of the larger hydraulic mines in the State having been stopped running by legal process, the total product of gold has been diminished thereby, to the extent of two or three million dollars per annum. This deplorable necessity, if necessity there existed for such action by the courts, has caused much distress to the inhabitants of the districts most affected, while it has so diminished the yearly output of gold, and financially ruined many who had invested largely in this branch of mining. As the months go by, the hardship caused by those extreme measures, becomes more and more manifest, and there is fast being developed a public sentiment that will demand some relief for these sufferers through legislative action, if none can be procured through the courts. The hydraulic miners were willing to comply with the requirements of Judge Temple's decision, which permitted them to continue operations after making such provision for impounding their tailings as satisfied the court. By Judge Sawyer's decision, they are not permitted to do this, but are absolutely prohibited from working their claims, the court assuming their inability to so dispose of this material, that it will cause no serious harm to other interests. While some of these companies do not, perhaps, possess such natural facilities as would enable them to construct effective retaining dams, the most of them would be able to erect such structures, and these latter ought to be allowed to at least make the experiment.

A number of these companies, since being stopped from hydraulic washing, have tried the plan of working their ground by the drift method, which has in some cases proved successful, while in others it has resulted in failure.

With the closing down of so many mines in the central counties, the Trinity, Salmon and Klamath rivers, in the northwestern part of the State, are likely soon to become the more active centers of hydraulic operations, there being no likelihood of such operations ever being there interfered with by judicial proceedings. The waters of these rivers find their way to the ocean through deep, narrow canyons, along which there are no farming lands of any extent, none whatever so situated that they can receive any damage from the hydraulic slums. As these streams are not navigable, and the Klamath, which receives the waters of the other two, debouches directly into the ocean, there being no bay or harbor at its mouth, it follows that no injurious filling up or shoaling can there result from these slums, however great the quantity discharged from the hydraulic mines. The auriferous gravel banks along the Klamath, are said to be very extensive, occuring in bars and benches for nearly a hundred miles on either side of that stream. These gravel deposits are rich in gold, and enjoy entire freedom from the volcanic ash and lava flows that so encumber many of this class of deposits further south, rendering the working of them by the hydraulic process difficult and expensive or preventing it altogether. Water in great abundance can be introduced upon these Klamath mines at little cost. They can also be outfitted at small expense, lumber in that country, which is everywhere well timbered, being extremely cheap. The winters are mild, it being possible, in so far as climate is concerned, to continue gravel washing the year round, as is done by such companies as have taken the trouble to provide themselves with a steady supply of water. A good deal of attention is now being turned to that section of the State, where a number of important hydraulic enterprises will, in all probability, be set on foot within the next year or two.

The past, with the companies that have been permitted to run, has been a fairly prosperous year in hydraulic mining, while the incoming year seems to be opening auspiciously for that interest. Already this class of miners, having a good supply of water, are actively at work, with the prospect of an average good season before them.

In the Department of Drift Mining,

Operations during the year have been unusually active and generally successful, there having occurred fewer failures perhaps than ever before, while the new departure of the hydraulic companies, as noted, has added considerably to the output of this class of mines, a number of new claims have also been brought to a productive condition, some of the old companies having meantime made an excellent year's work. The Forrest Hill and San Juan divides, with various other localities in Placer and Nevada counties and also in Butte, Plumas and Sierra counties, have continued to be the principal sites of drift mining. A great deal of preliminary work has also been done in the neighborhood of Slate creek, which the current year promises to become the theater of active drift operations.

In Sierra county during the past year the mines have done pretty well. The Bald Mountain Co., at Forest City, have been engaged during the year in coming back with pillars in their extensive drift mine, and realized handsomely. The Bald Mountain Extension Co. have cleaned up from the gravel taken out of the South Fork claim, through which they are following the lead back to their own channel, nearly $70,000 for 1884, over $40,000 of which has been paid out in wages. They will be working the pay channel on their own ground by the first of May. Beyond a lava flow, 1,100 feet in width, the extension of their lead has been found, which, without doubt, extends for miles up the Pliocene ridge, insuring all the lucky stockholders a handsome fortune. A large, well-washed quartz boulder ceils one of the breasts. An incline, at a grade of one foot in four, is being put up 240 feet through the lava to reach the channel over 50 feet above the main tunnel, only 40 feet of which remains incompleted. The loaded cars going down will haul up the empty ones. On the completion of the incline, about February 1st, the working force will be largely increased. The gravel is so rich that large specimens are frequently found in the breasts, and pays $5 per carload. It is believed that a gold lead lies under the lava flow, which will be prospected in time, so more good news can soon be looked for from the Extension. At Alleghany the drift miners have realized very fair returns from their claims. Two quartz ledges are now being successfully worked in Slug canyon, at Downieville, one with a mill and the other by an arastra. The Sierra Buttes quartz mine, Sierra City, owned by London capitalists, continues to yield good and steady dividends. Three hundred men are employed. The drift mines at Gold Leake, on the numerous forks of the Yuba, Goodyear Bar and in Northern Sierra, have during the past year contributed largely to the world's store of gold. These mountains are inlaid with precious metals, only awaiting the talismanic influence of capital to reveal their untold wealth. The Alaska quartz mine, at Pike City, is very rich, and promises to soon enrich its fortunate owners. The late rainfall was joyfully welcomed by the miners, as it enables them to resume work in

their claims. Sierra county is one of the best fields for lucrative investments of capital on the Pacific Coast, and will be more appreciated as its vaults of gold continue to liberally swell the treasuries of the world.

River-Bed Mining

Finds most encouragement in the northern part of the State, being extensively engaged in along the Trinity, Salmon, Scott and Klamath rivers, where the conditions for pursuing it are unusually favorable. The year, under consideration, proved to this class of miners a good one, the water having remained at a low stage until late in the fall, thereby securing to them a long working season, a condition on which their success is always mainly dependent. The river beds in the more central and southerly counties, having been pretty well worked out years ago, are now the sites of but few operations of this kind, those carried on there now being mostly by the Chinese, who pursue the business here as elsewhere, only in a limited way. Nevertheless, they find it profitable and neglect no opportunity that offers for buying river-bed claims, which are worked generally by companies, each member of which has an interest in the venture. Great numbers of these people engage in river-bed mining along the Trinity every summer.

Silver Mining in California.

Having, within the past few years, attained very respectable proportions, some remarks on the condition and prospects of that industry are now in place. At one time considerable silver was produced at the Cerro Gordo mines, Inyo county, as much as six or seven million dollars having been turned out there between the years 1872 and 1878, the total product of this metal made in the State up to this time amounting to about $30,000,000. Not until the discovery of the argentiferous deposits in the Calico District, San Bernardino county, however, did silver mining in California promise to grow into a largely productive, profitable and permanent business. Although this discovery occurred only about three years ago, these mines have since turned out nearly $10,000,000, and that without the aid of much capital, except what they have themselves produced. Meantime explorations have brought to light many other silver lodes in that region of country, leading to the organization there of several mining districts in addition to Calico, the more important of these, so far as production goes, consisting of the Trojau, Grapeviue and Pinacate, the Ivanpah and Providence Districts lying to the north and east of Calico, having been organized many years ago.

Calico, the most central, promising and productive district and site of the original discovery, is situated in a rugged mountain range at a point seven miles north of Daggett, a station on the Atlantic and Pacific railroad. The district is in the very heart of the Mohave desert, the country for many miles around being timberless, barren and arid in the extreme. The geological formation is, nevertheless, favorable for the occurrence of rich and permanent silver-bearing deposits, consistiog in the main of porphyritic rocks. The veins, not generally large, are yet compact and shapely, and staud at nearly all angles from vertical to horizontal. The ores are of several varieties being composed mainly of horn silver, chlorides of silver, red silver ore and uative metal. They are all of the free milling variety, being as easy of reduction, perhaps, as any ever found. There are now eight or ten mills running in that section of country, none of them expensive or of large capacity, but all kept fully employed and all making money, custom mills receiving $20 per ton for working ore. More mills are needed, and it is expected that a number of new ones will be put up the comiug summer. The output of the mines will he much larger this year than last, and it is probable that the product of the country will steadily increase for several years to come, as the ore bodies already partially developed hold well in depth, and many of the districts in which hut little work has yet been done appear to have a promising future before them.

Outside of San Bernardino county we have in California a great extent of argentiferous territory—enough in Inyo county alone to constitute it a prolific and profitable producer of silver were this class of its resources fully developed, as there is reason to believe they soon will be, now that a railroad has penetrated that region. There occur heavy deposits of silver ores in Mono, Alpine and Shasta counties, hut they are generally base or of the varieties that require reduction by smelting, for which, and other reasons militating against their economical handling, very little has as yet heen done with them. After a time, and perhaps before long, these deposits will all he worked, and their product, coming in to supplement that of the still more important fields farther south, will advance California to the front rank among the silver-producing countries of the world.

Quicksilver.

The production of this metal in California has for several years past been declining at a rate that has only to go on a little longer to carry it to the vanishing point altogether. As compared with 1883, the production last year shows a falling off equal to 14,812 flasks, with little prospect that the ou'put will he increased the current year, if indeed the downward tendency shall he arrested.

As will be seen hy the appended tahle of production, for which we are indehted to Mr. J. B. Randol, of the New Almaden mine, all the mines have decreased their production. Not only have most of the smaller mines been closed, but some of the larger ones as well, and if we are to believe reports, others are to follow. The price of quicksilver has heen low, though it is now somewhat improved.

The Altoona mine, Trinity county, which has been closed for several years owing to legal complications, is to he worked again, the legal troubles having heen adjusted. As regards the numerous mines in Napa, Sonoma, San Luis Obispo and elsewhere in the State, that were forced to succumh to the accession of low prices for quicksilver, there is little chance of work being resumed upon them even with the present improved market, as much money would he required to put them in productive shape, only a few of them ever having heen thoroughly opened or properly equipped. From some of them the plant has heen removed, on others the sbafts and tunnels have caved in, and it is highly probable not a few have been ahandoned altogether. Little therefore need be expected from any of these mines, at least for the present.

PRODUCTION OF QUICKSILVER IN CALIFORNIA FOR THE YEAR 1884.

Months.	Eldorado.	Napa.	Sonoma, West'n	Sonoma, Guadalupe.	New Idria.	Sulphur Bank.	Redington.	Great Eastern	Various	Total Flasks.	New Almaden.	Total Pounds (Grand Total (flasks))	Price in S. F. Per Flask. Highest.	Price in S. F. Per Flask. Lowest.
January	320	135	373	0	102	203	127	38	7	1,305	1,440	2,805 (2,805)	$36.25	$36.00
February	276	174	341	0	150	0	104	0	0	845	1,468	2,313 (2,313)	39.00	36.50
March	349	152	293	0	96	63	123	9	0	693	1,777	2,470 (2,470)	39.00	38.50
April	422	60	292	0	75	76	50	0	0	594	1,705	2,299 (2,299)	39.00	38.50
May	345	0	258	0	125	200	53	6	0	708	1,672	2,470 (2,470)	39.00	38.50
June	215	101	258	200	44	0	118	0	0	896	1,809	2,705 (2,705)	39.00	38.50
July	374	0	200	0	29	0	0	0	0	1,095	1,543	2,638 (2,638)	39.00	38.75
August	228	138	334	0	0	52	71	0	0	1,108	1,804	2,912 (2,912)	39.00	38.75
September	169	110	334	0	68	25	47	0	0	1,043	1,626	2,668 (2,668)	39.50	39.00
October	153	90	328	160	116	25	68	104	0	1,043	1,448	2,377 (2,377)	41.00	39.00
November	132	240	330	150	157	58	32	91	0	1,050	1,900	2,950 (2,950)	34.00	29.00
December	172	130	292	165	162	98	36	40	0	1,023	1,860	2,885 (2,885)	35.00	32.00
Totals	3,031	1,570	3,292	1,170	1,025	800	881	392	7	11,913	20,000	31,913		
Production in 1883	4,307	1,376	3,469	1,184	1,606	1,844	1,099		101	17,725	29,000	46,725	$38.50	$36.00
Production in 1882	6,580	3,849	5,941	1,184	1,606	2,612	1,099		241	24,602	25,070	49,672	39.00	37.25
Production in 1881	6,849	5,552	6,941	1,184	1,606	2,612	1,099		854	26,701	35,000	61,701	39.00	37.50
Production in 1880	6,442	4,416	6,442	1,184	1,606	2,612	1,099		1,660	30,401	23,465	53,866	34.45	27.25
Production in 1879			6,670	1,184	1,606	2,612	1,099							

SAN FRANCISCO, Dec. 31st, 1884. Production of Eld. and Napa Con. not segregated in former years.

Useful Metals and Minerals.

Besides quicksilver we mine and smelt or otherwise reduce a variety of the other useful metals; lead, copper, iron and antimony, all, as yet, in a rather limited way, though the most of these occur here in great abundance. Among mineral substances we utilize our deposits of coal, salt, horax, asphaltum and petroleum extensively—also collect a little chromium asbestos, gypsum, mica, sulphur, graphite, manganese, etc. We hurn yearly immense quantities of lime, manufacture the useful clays into stoneiron wares, pottery, terra cotta and bricks; quarry huilding stones of every description, including several varieties of marble—also granite and hasalt for street paving purposes, our resources as regards the most of the natural products being ample, and that these developments will keep pace with the general progress of the State may reasonably he expected.

ARIZONA.

Notwithstanding the fact that Arizona mines which first gave the Territory its reputation, were those of silver, and that this class of mines are still yielding largely, of late the wonderful copper production of the region, has drawn more general attention to its universal resources than the mines of precious metals.

Wells Fargo's report gives the following figures for Arizona, of the precious metals which have passed through their hands during 1884:

Gold dust and bullion by express	$ 360,791
Gold dust and bullion by other conveyances	100,000
Silver bullion by express	3,139,628
Ores and base bullion by express	3,455,960
Total for the year	$7,056,379

The report shows a considerable falling off from the product of 1883, hut when we remember that the Tombstone mines were shut down for a number of months, the amount shipped is decidedly flattering, and indicates that other portions of the Territory are heavy producers.

As showing the wonderful increase in the yield of Arizona, since the opening of the Southern Pacific Railroad, we give the figures compiled by Wells, Fargo & Co's Express, for the past six years:

Production for 1879	$1,042,403
" " 1880	4,472,471
" " 1881	8,198,766
" " 1882	9,298,267
" " 1883	8,183,742
" " 1884	7,056,379

From being seventh in the list in 1879, Arizona became fifth in 1880, fourth in 1881, third in 1882, fourth in 1883, and fifth in 1884. A large quantity of rich ore and hase bullion, which finds its way out of the country, is not included in the ahove, and it is safe to estimate the value of such ores and hullion as 10 per cent of the figures given. Mr. Patrick Hamilton, in his *Resources of Arizona* says: From the most careful estimates and reliahle data from every county, the total yield of gold, silver and copper for 1883 was $12,000,000. There is no mining region on the coast or east of the Rocky mountains that can make a more flattering showing. Facts speak louder than words, and Arizona points to her record in the past as an earnest of what she will do in the future.

The copper product of the Territory for the past five years has heen, as near as can he ascertained, as follows:

Production for 1880	2,000,000 lbs.
" " 1881	5,000,000 "
" " 1882	15,000,000 "
" " 1883	24,500,000 "
" " 1884	27,006,481 "

The value of the product for 1883, even with the low price of copper, reached nearly $3,000,000, or nearly one-third the entire hullion yield of the Territory. The growth of this branch of the mining industry of the Territory has heen something remarkahle. Ten years ago there was only one furnace in the country—a primitive concern in the Mexican style—with a capacity of from one to four tons daily. Now there are in active operation over 20 furnaces, with a capacity of over 1,000 tons.

The past year can hardly he said to have heen a prosperous one for Arizona miners. The strike among the Tombstone miners lessened the production of Cochise county, and only a part of the miners in the camp mentioned are at work. The Contention produced in 1882 $1,676,705 from 25,017 tons of ore; in 1883 it produced $553,085 from 13,652 tons; in 1884 the production was small. The Grand Central, which started milling in March, 1881, has produced over $3,000,000. Last year the mine was practically a non-producer. The Tombstone Mill anc Mining Company own 11 claims, among them the Toughnut and Goodenough claims. They hegan mining in 1878 and milling in June, 1879. From June, 1878 to March 31, 1883, they produced iu hullion $2,870,787, mainly in silver.

The summary of the year's operations in Arizona, given in the Tucson *Star*, is more statistical than any other, and though some of the figures are estimated they may he considered approximately correct.

The silver and gold output for the Territory during the year was considerahly less than for 1883. This falling off was the result of several causes, the most natural heing that of the miners' strike in Tombstone, the principal hullion producer in the Territory. The strike continued for ahout four months, which caused an entire cessation of all operations, added to this the fact that water has been encountered in in such large quantities that the lower working of the mines cannot he operated until pumping machinery is put in place. Both the Contention and Grand Central mines have heen practically non-producers during the year, hut the year 1885 promises better results, not only in Tombstone, hut many other districts, especially that of Quijotoa, will add large returns to the precious metals during the year. The output given helow is not as full and correct as might be desired; but we helieve it will not fall much helow the correct figures. Besides gold and silver there was a considerahle quantity of lead produced, which is not given. The Benson smelter and the United Verde make the most encouraging showing. The latter shipped $900,000 in copper hullion and $300,000 in silver bullion, and Benson smelter ahout the same amount. The output, however, as stated helow, representing the total value of silver, copper and lead of the Benson works:

TOMBSTONE SILVER.

T. M. & M. Co., gold 33,752, silver 397,326	$ 435,018
Grand Central	483,882
Boston Custom Mills	106,888
Benson Smelter (value of total product)	898,800
United Verde	300,000
Yekel Mine	88,000
Jesse Benton	48,300
Shipped through Yuma express office	191,940
Shipped through Tucson express office	136,032
Total	$2,683,920

ESTIMATED.

Yavapai county, not reported	$ 450,000
Mohave county, " "	250,000
Arizona Central	60,000
Silver King	800,000
Pinal Consolidated	20,000
Head Center	25,000
Mineral Hill	15,000
Golden Rule	30,000
Tevis District	12,000
Districts not mentioned	600,000
Total	$4,959,920

Among the famous mines of this Territory is the Silver King, which has yielded over $5,500,000, and paid the stockholders $1,375,000 in dividends, without any assessments ever having heen levied on the stockholders. The mine was worked by private parties until May, 1877, when it was incorporated. Last year has not been so favorahle for a large production as in the preceding years, and the expense has been somewhat proportionately greater, consequently the profits have been less, the dividends paid heing paid $50,000, with a halance on hand December 31, 1884, over and ahove all indehtedness. The leasing of the Windsor mill of five stamps has proved profitahle to the Silver King Company, where ore that could not he profitahly concentrated has heen reduced to hullion hy amalgamation.

The following figures show the receipts and dishursements for the year 1884:

Dr.	
To balance on hand Jan. 1st	$25,150.65
" sale of bullion	48,587.83
" sale of concentrator	427,811.04
Total	$501,555.52
Cr.	
By sampling and assaying	$331.50
" expenses	8,293.37
" insurance	750.00
" freight	25,655.26
" merchandise, timbers and lumber	46,412.14
" dividends Nos. 44 and 45	50,000.00
" Superintendent's drafts	337,054 41
" balance on hand Dec. 31st	33,008.87
Total	$501,555.52

The Quijotoa mines, which created some excitement two years since, when the honanza firm became interested in property in that camp, have not made any brilliant record so far, although much is expected of them. The mines are heing developed, however, and have heen listed on the San Francisco Stock and Exchange Board.

Of course, in the course of a comparatively hrief review such as this, it is not possible even to mention the many camps or mines in the Territory. Outside of the gold, silver and copper, there are deposits of coal, petroleum, etc. Mr. Hamilton says: "Large dcposits of salt are found in different parts of the Territory. Along the Salt River canyon, in Gila county, there are a number of bluffs from which salt oozes through the rocks and crystallizes. This salt is of an excellent quality for all domestic purposes, and will no doubt yet he utilized for dairying and stock raising. There are also large salt deposits in the neighborhood of Fort Verde, Yavapai county. This salt contains quantities of soda and magnesia, and is used largely hy stock growers. Besides the mineral deposits here described, there are many other rare and beautiful varieties, which to

treat in detail would require a volume. Mica is found in every county in the Territory, and some very clear and beautiful sheets are frequently encountered. In the Tonto Basin, near Salt river, there are large deposits of asbestos; fibers are long, white and of a delicate texture. No attention is now paid to the article, but cheap transportation will yet make it valuable. Iron exists in all parts of the Territory, and some very fine deposits of bematite are found in Gila county. Beds of fine, clear alabaster have been discovered in the Graham mountain, and marble of a fine quality is encountered in the Santa Catalina range. Antimony assaying eighty per cent has been located in the Chiricahuas, and tellurium has been found in the Sierra Prieta."

Copper Product.

The copper product of Arizona for 1883 was put at 25,470,734 pounds. The output for 1884, as far as heard, foots up in round figures to 27,000,000 pounds; and although a large number of copper-producing mines closed down last year, owing chiefly to the high cost of fuel and transportation, yet the product, instead of falling off, was advanced more than two million pounds. The outlook for 1886 assures us that the output will be very large—not less than 50,000,000 pounds—as there are several large prospective producers, two of which are in operation, and the other will be early during this year.

The following are the estimates for 1884. There are several small producers not heard from, and while the estimate contains the value of copper ore shipped from southern Arizona, as far as could be learned, yet there has been a large quantity shipped from northern Arizona not reported. The figures given are official, except when marked estimated:

Copper Queen	8,048,000
Detroit Copper Company	3,000,405
Old Dominion	5,125,000
Arizona Copper Company (Clifton), estimated	2,225,000
Cochise Copper Company	607,632
United Verde	5,000,000
Copper Prince (ore) produced bullion	545,000
From ore shipped from Benson	082,030
San Carlos (estimated)	125,000
Copperosity	112,000
Casa Grande	78,847
Bullion from ore shipped from various districts	984,074
Estimated bullion from copper matte	263,493
Total	27,006,481

COLORADO.

The State of Colorado, as has been the case for some years, still holds first position in the list of bullion producing regions, notwithstanding her product last year is $4,076,251 less than in 1883. Colorado is about $5,000,000 ahead of California last year. The output of the Leadville District in gold, silver and lead for the year 1884 was $12,392,400, an increase of $2,134,400 over 1883, with a number of mines that produced largely in 1883 closed during the greater part of the year on account of the low price of lead. The chief of these was the Silver Cord, one of the heaviest producers in the district. The product of lead alone was 46,800 tons, a considerable increase as compared with 1883.

As Leadville is the most important camp in the State, and produced more than half of the total yield of Colorado, consideration of its output is of great interest. The Leadville *Democrat* took great trouble in ascertaining details from the people in charge of smelters and samplers, and presents the following figures:

The smelters of Leadville report the following production:

	Bullion, Tons.	Lead, Tons.	Silver, Ounces.	Gold, Ounces.
Arkansas Val	9,026	8,978	1,404,156	5,764
American	8,000	7,968	775,000	5,500
La Plata	5,252	5,187	1,568,688	2,466
Harrison	5,095	5,962	935,124	1,484
Pryer Hill	4,549	4,523	617,955	3,412
Manville	2,659	2,638	511,801	1,000
Total	35,481	35,256	5,812,124	19,570

The total value of the above is computed as follows:

35,256 tons of lead at $3.65 per 100	$2,573,688
5,812,724 ounces silver at $1.10	6,393,996
19,576 ounces of gold at $20	391,520
Total metallic product of smelters	$3,259,204.00
The Omaha and Grant sampler received 53,000 tons of ore, containing 10,001 tons of lead, valued at $3.65	780,443.00
1,215,549 ounces of silver, valued at $1.10	1,337,104.00
	$2,117,547.00
6,272 ounces gold at $20	125,440.00
	$2,242,987.00
Of this one-tenth was transferred to Leadville smelters	224,299.00
Value of shipments to Denver	$2,028,688.08

The gold in the ore came largely from the Lilian Mining Company,

The Arkansas Valley sampler bought for outside parties 2,637 tons of ore, dry weight, containing 1,686.6 tons of lead, valued at $3 65	$123,121.00
257,421 Ounces silver at $1.10	283,164.00
	$406,285.00
The Colorado Smelting Company, of Pueblo, received, dry weight, 7,485 tons of ore, containing 1,024 tons of metallic lead, valued at $3.65	74,752.00
394,057 ounces silver, valued at $1.10	433,463 00
	$508,215.00
About 20,00 thousand tons of iron were shipped to other parts of the valley and Utah, valued at 85	$100,000
About 1,000 ton of lead ore to Utah, valued at	20,000
Our Lake county placers produced in gold about	30,000
The stamp mills are estimated to have produced in gold	10,000
And in silver	30,000
Total	$190,000

The Pueblo Smelting and Refining company received its shipments from Leadville chiefly through the Arkansas sampler.

Following is a recapitulation of the various sources of mineral production:

Product of smelters	$ 9,259,204 00
Shipments by Omaha and Grant	2,028,688 08
Shipments by Arkansas sampler	406,285 00
Direct shipments to Colorado Smelting company	508,215 00
Shipments of iron ore	100,000 00
Shipments of lean ore to Utah	20,000 00
Placer product	30,000 00
Product of mills	40,000 00
Grand total	$12,392,392 00

The following is the total lead tonnage:

By Leadville smelters	35,256
Shipped by Omaha and Grant, less ten per cent. which remained in Leadville, 10,611	9,622
Shipped by Arkansas sampler	1,086
Shipped to Utah, 25 per cent. of 1,000 tons	250
Total tons	46,814

The above figures prove that the silver grade has somewhat increased, and that the ore value has largely improved by the increase of gold therein, while the lead product is far below that of last year.

Clear Creek county is supposed to have produced more ore in 1884 than any previous year, it being acknowledged that the large figures given a few years since were exaggerations. Last year's output illustrates the fact that Clear Creek county has arrived at a season of substantial prosperity. It is not of a spasmodic, but solid nature, and has many peculiarities.

The Georgetown *Courier* says: There are a number of ore buyers in Denver who have been in the Clear Creek market, and turned their purchases over to the smelting works who put the ore under the head of "miscellaneous." To get at anything like an accurate report, the amount purchased by Denver ore buyers must be known. But one of these firms have made a report. Mathews & Webb, in their circular, give their purchases in this county at $222,028.60.

Following are the only reliable figures yet obtained regarding the production of this county:

Boston and Colorado Co	$918,000 00
Golden Smelting Works	284,357 00
Mathews & Webb	222,028 60
Freeland smelters	344,009 00
Gold purchased by bank of Idaho Springs	12,550 52
Gold purchased by banks of Georgetown	8,000 00
	$1,860,936 15

The Grant smelting works, Pueblo smelting works and a number of Denver ore buyers are yet to be heard from. The Grant works are thought to have handled over half a million dollars' worth of our ore.

But meager reports have been obtainable from the gold producers. A great part of the gold from Empire, Fall River and Idaho was sold to Central City banks, which Gilpin county gets credit for. A great deal of ore has always been sent to Gilpin county.

The Freeland smelter produced in 1884, $281,000 gold, $60,000 silver and $3,000 copper. Total, $344,000.

The total weight of ore shipments from the Georgetown depot during 1884, was 14,422,400 pounds, or 7,211 tons, valued at nearly one million dollars. There were 654 cars, 206 of which were sent to Argo, 357 to Denver, 85 to Golden, 4 to Idaho and 2 to Black Hawk.

The many changes in the management of the sampling works at this end of the county prohibits the getting of figures from that source. Nearly all the ore purchased by the Silver Plume works and the Miners works of Georgetown during the early part of 1884, was shipped to Pueblo smelting works. These works have not reported.

The Public Ore Market of Georgetown handled during 1884, 3,683 tons of ore, valued at $513,000. The average value of the ore was $139 per ton. These works ran steadily during the year, and were under the management of Morris & Duncan until the first of September, when Mr. Morris sold his interest to Mr. M. Wheeler.

The works of G. W. Hall & Co. were in steady operation throughout the year.

In February, 1884, Messrs. W. A. Duff, J. M. Sayles and E. C. Billings re opened the Silver Plume works and the Miners works of this place. The former shut down in October and the latter in November.

The Rocky Mountain works were run for a number of months during the early part of the year, under the management of Jas. A. Noone.

The Boston and Colorado works furnish the following statement of their business for 1884:

	Gold.	Silver.	Copper.	Total.
Clear Creek	$210,000	$652,000	$ 56,000	$918,000
Gilpin	083,000	170,000	108,000	961,000
Boulder	128,000	59,000		197,000
Lake		68,000		68,000
Summit		124,000		124,000
Park	11,000	108,000	1,000	120,000
Gunnison		83,000		83,000
Custer	3,000	4,000		7,000
Hinsdale	2,000	3,000	7,000	12,000
Saguache		11,000		11,000
San Juan	2,000	6,000	3,000	11,000
Ouray	1,000	4,000	2,000	7,000
Chaffe		11,000		11,000
California	2,000	30,000	3,000	41,000
Idaho Territory		4,000	2,000	6,000
Nevada	2,000	5,000		7,000
New Mexico	45,000	59,000	11,000	115,000
Arizona		30,000	11,000	41,000
Utah	3,000	45,000	23,000	71,000
Montana	46,000	432,000	220,000	689,000
Mexico		37,000	1,000	38,000
Miscel's	211,000	619,000	38,000	868,000
	$1,350,000	$2,566,000	$486,000	$4,411,000

Following are the purchases of the Golden Smelting Works:

	Tons.	Gold.	Silver.	Lead.	Total.
Clear Creek	2,138	$ 7,696	$228 145	$48,533	$284,375
Gilpin	5,940	180,446	60,545	6,462	247,453
Boulder	676	76,386	18,839	428	95,855
Lake	587		42,236	13,941	56,178
Summit	45	475	1,196	1,420	3,092
Park	9	141	376		518
Saguache	155	81	1,544	5,440	7,066
New Mexico	16		3,859		3,859
Miscellan's	355	8,238	5,387	5,150	18,776
	9,921				$717,172

The average value of the ore treated by these works from this county is $133 per ton.

The Central City *Register-Call* puts the product of Gilpin county for 1884 as follows:

Smelting ore	$1,122,975 00
Tailings	413,526 00
Gold shipments by banks	990,900 00
Individual shipments	54,501 00
Miscellaneous	7,500 00
Total	$2,656,901 00

The total product for the previous year was $2,208,989, which shows an increase for the year 1884 of $447,912. This is surely a most excellent showing and every man in Gilpin county is proud of it. For a county so small as Gilpin and one that has been mined vigorously for a quarter of a century the product for 1884, standing without comparison with the previous year, is truly marvelous. It speaks volumes for the fissure veins of the county, which holds out so well. The deepest mining in the State is done here and also the oldest.

The Idaho Springs *News* makes the following statement of the ore business in that vicinity:

Purchased by the sampling works from May 1 to Dec. 31, 1884:

Silver	$90,661 57
Gold	56,760 60
Lead	37,164 60
Copper	7,529 54
	$192,116 21
Estimated value of ore produced from Jan. 1 to May 1, 1884	$100,000 00
Estimated value of gold sold and ore treated at Central City	50,000 00
Freeland smelter and H. & W. mine	590,000 00
	$842,116 21

From Crested Butte the ore output does not seem to have been so much as was expected. The Forest Queen, one of the heaviest producers, has been idle while the concentrator was being put in. The Ruby Chief is flooded with water. The Elk Mountain *Pilot* says: Our mineral output the coming season will be at least three times as large as for the season just past. Our coal output also bids fair to double its present proportions in a couple of seasons if rates can be had by other companies that are equally as advantageous as those which the present companies enjoy. It is well to say that this corporation is the life of Crested Butte, but were it not for the discriminating rates which it has forced upon other producers, Crested Butte would be to-day a city of three thousand instead of fifteen hundred inhabitants.

The output of Ouray county for 1884 is an enviable increase over the preceding year, and yet several hundred thousand less than we expected in December last, when the outlook for the D. & R. G. Railroad was considered flattering, and the disastrous slides of Dec. 18, 19 and 22, had not been visited upon us.

The *Muldoon* says: The season of '84, owing to the unprecedented snow-fall during the closing weeks of '83 and early months of the present year, delayed shipping until July, when the high water interfered, and added four weeks of paralyzation; but in spite of all obstacles intended to impede and embarrass we get to the front in enviable shape, and still maintain our position as the banner county of the San Juan. The estimates are made upon net figures garnered from mines, mills and managers, and in many instances yielded (on account of the war on silver), very reluctantly and then only with the promise on our part that the districts should be listed as a whole, and the names of the mines in the list of producers, but not the yield of each property, or the names of the owners itemized separately. The estimate for Mt. Snellles, Poughkeepsie, Uncapahgre, Bear Creek and Dallas districts is $350,000, of which the Virginias, Monongahela and Sidney have produced the lion's share, and one of which (the Sidney) is still shipping. In Poughkeepsie the county line runs north of the water shed or summit, and the two heaviest producers, Old Lout and Alaska, are in San Juan county, although tributary to Ouray and finding an outlet via Montrose. The Alaska output was shipped to Silverton and marketed at the sampling works in that very prosperous camp.

In Pitkin county, the Aspen *Times* says the prospects of the camp were never brighter; some of most conservative men, who are in a position to know, think that Aspen's mineral output for 1885 will easily reach $10,000,000. The smelter blew in July and has produced nearly $500,000, while there has been a gross production of mineral wealth during the year past of nearly $1,500,000. We have no desire to call a grand rush of laboring men here until the development is sufficient to employ them. Capital is fast coming to the rescue, and the day is not far distant when Aspen will rival any camp in the State, not excepting Leadville. Heretofore we have given that camp the exception, but as pointers now indicate Aspen will equal if not excel Leadville in profitable mining.

In making a summary of the mineral output of the entire Elk Mountain country, the *Pilot* has been at no little pains to obtain figures that are as near accurate as possible. Trusting that there will not be too wide a breach between our figures either way, we place before our readers the product of the mines from this entire Elk Mountain country, which finds its egress at Crested Butte. Owing to the facilities we have to get these figures we think the parties interested will overlook all mistakes. The figures concerning the mineral shipments from Crested Butte for the year ending December 31, 1884, are as follows:

From	Tons	Est. Value of Ore.
Forest Queen mine	260	$ 36,400
W. H. Con	20	2,000
Augusta mine	250	20,000
Domingo	70	4,500
Aspen S. Co (bullion)	20	10,000
" " " (ore)	60	6,000
Montezuma	80	8,000
Little Crown	10	1,000
Excelsior	40	2,800
Sylvanite	40	25,000
Tam O'Shanter	20	1,000
Bradburn	10	1,000
Black Queen	80	5,000
Rose Sampling works	80	10,000
Total output	1040	$133,600

From the above figures it is well known that every mine there mentioned is undergoing development, with perhaps the exception of the Forest Queen, and the attention of that company has been directed toward building a mill all summer. This seems to have been a year of experiments and developments, with a view of future production. The most of the companies above named are really in a condition to make large outputs the coming year, and we sincerely expect to make a much better showing than we are able to at present.

In the above tables we have only enumerated the ore shipments that were direct, and it will be seen that the Rose sampler handled 80 tons that were principally in small lots. These small lots are from the following claims: Milwaukee, Gov. Tabor, Iron Duke, Silver Spruce, Buckeye, Excelsior, Iron King, Niagara, Maryland, Belle of Titusville, Ohio, Republic, and Hudson, all of the Rock Creek country. Then the Michigan from Ashcroft, the Jacob Strader from Poverty gulch, the Great Eastern, Little Crown and Eureka, of Irwin. Here are 18 claims, the most of them just made their first shipment of say from one to five tons just as an experiment. In almost every case the shipment has been a success.

In San Miguel county it was difficult to get exact returns, because mine owners objected to giving them. The *Telluride Journal* states that

the output of the county has been more than half a million dollars, which is a remarkably good showing, when it is considered that almost no work was done upon the mines until in July, and that the output is the result of a little more than four months' active work. There is no question but what many properties have been put in shape the past season for extensive working and a large production during the present year, and we confidently predict, that should no unfriendly legislation be had upon the silver question this winter, San Miguel's output for 1885 will reach a million dollars, nearly half of which will come from the Smuggler, Sheridan, Cimarron and Mendota claims, in Marshall basin. The following is a partial list of the producing mines in San Miguel county, with the number of tons of ore produced by them, which has either been shipped, concentrated or otherwise treated. This list is subject to additions and corrections, as more accurate information is obtained. The value of the ore and bullion is about $675,000. This does not include $15,000 worth of ore concentrated and shipped from the San Miguel mill early last spring: Cimarron, 920 tons; Pandora, 2,200; Sheridan; 1,500; Nellie, 500; Smuggler, 500; Boomerang, 75; Alta, 20; Mendota, 100; Gold King, 1,500; Cincinnati, 73; Flora, 15; Silver Chief, 50; Silver Glade, 30.

List of mines in Iron Springs districts, San Miguel county, having produced ore during 1884: Nevada, 298 tons; Caribou, 235; Silver Bell, 90; Butler, 75, Parsons, 10; Fulton, 20; Spar, 10; Grand View, 60; Valley View, 22; Acme, 10; Sulphurettes, 50; Golden Eagle, 25; Osccola, 250; Santa Cruz, 15; Suffolk, 105; Geneva, 20; Cleveland, 5; Summit, 250; Statsburg, 20.

IDAHO.

It is a matter of surprise that Idabo should have shown such a falling off in bullion product for the year 1884, as compared with the previous year. In fact, the Territory shows the largest reduction of any of the bullion-producing regions with the exception of Colorado. This is the more surprising, as within the past year a great deal of attention has been paid to Idabo mines, and it was expected that the developments being made in many of the camps would increase the bullion yield materially. Estimates, however, have been exaggerated, as the summing up of the year's work proves, and only about three and a half millions of dollars appears to have been produced, according to accepted figures. It may be mentioned, however, that one county alone—Alturas—claims to have yielded $4,000,000, or about half a million more than Wells, Fargo & Co. attribute to the whole Territory.

Of this county, the Wood River *Times* says: The ore and bullion shipping business of this county is getting so systematized and concentrated that it would seem very easy to obtain accurate statistics, yet such is not the case: the samplers and smelters, being owned by individuals or operated by agents, these do not always feel at liberty to supply the desired information, because their patrons might not care to have their production known. Yet it is possible, by drawing upon various unofficial sources of information, to arrive at a fair estimate of the yield.

The Vienna Company, for instance, has produced steadily during the past year, at the rate of one and a half bars of fine bullion, worth about $1,500 each. This would be some $2,250 per day, but the mill having been idle occasionally, from various causes, its total production of bullion for the year may be placed at not more than $750,000.

The Atlanta and Rocky Bar bullion does not seek a railway via Wood River, as it has a nearer shipping point at Mountain Home. The yield of the two camps mentioned, the past year, is, however, stated to have been nearly $500,000.

The Ketchum works shipped bullion and ore valued at about $350,000. This company had a very brief campaign, and the management did a "safe" business—that is, it made the business self-supporting—something unknown heretofore in the history of smelting on Wood River. While pursuing this conservative policy, its working facilities were increased, so that this year its output will be much greater than the last.

Bellevue and Broadford, the past year made quite a record as an ore-producing point. The Minnie Moore having changed hands, early in the year, her ores were extracted and marketed, and some $450,000 thus reclaimed from the vein where it had lain buried. The Queen of the Hills mine also became an ore-producer, and yielded about $150,000. The yield of the mines of Bellevue, Broadford and immediate vicinity for the year may be safely put down at $740,000,

Hailey still remains the shipping point for the mines of Bullion, Deer Creek, and intermediate points, most of the ore from which is sampled at the Hailey Sampling Works; yet, some ore was shipped without being sampled here. The total shipment from this point the past year will undoubtedly aggregate $1,500,000.

Muldoon did not make much of a showing this year. The owners of the smelting furnaces there are the same as are interested in the Ketchum furnaces, and having determined to make their operations in this country self-sustaining, they concluded to keep the Muldoon works closed for the year. Sometime during the summer, however, Colonel Ballentine and Fulton Haight succeeded in obtaining a lease of the company's property, and the output of the camp since probably amounts to about $75,000; while the yield of the Snake river placers will doubtless be at least $25,000.

The total output of the mines of Alturas county for the year 1884 may therefore be safely stated at $4,000,000.

The past year has been one of experiment and building. Smelting furnaces have been constructed in one place and "shut down" in others; several hoisting and concentrating works have been constructed, roasting furnaces built, and new mines discovered. But most of this was not ready for use until too late to make much of a showing this year. Next year, however, all this machinery will be available, and the output of Alturas county will (if Congress does not compel the shutting down of our mines) be fully seven million dollars ($7,000,000)!

The journal quoted, in speaking of the Wood River region, adds: From the first settlement of the Wood River region, the yield of our mines, notwithstanding the many disadvantages under which we have labored, has steadily increased. The first locations, after the Indians were driven out, were made in 1880; that year but a few tons of ore were shipped to Salt Lake: in 1881—the following year—the Wood River mines yielded $1,250,000; in 1882 the yield doubled; in 1883 it was $3,500,000, and in 1884 about $4,000,000. The total yield for the past four years foots up about $11,000,000.

Cœur d'Alene mines, in this territory, have proved failures as far as any wonderful riches are concerned. The mines on the famous Pritchard creek are placer, the bed rock being so deep where pay is found that much expense is incurred in opening the claims, thereby making it impossible for men without means to work them. Many of these are probably rich, and when worked, will no doubt pay well. Several good claims have been found on Trail Gulch and Potosi.

Trail Gulch is about five miles long with many side gulches, the richest yet prospected being Potosi. Potosi is some five miles long with many side gulches, which proves, when thoroughly prospected, to pay largely. Trail Gulch empties into Beaver creek, which is probably 20 miles long and a tributary of the north fork of the Cœur d'Alene river. Beaver, a mining town, is situated at the junction of Trail Gulch and Beaver creek. Beaver creek above Trail Gulch, as far as prospected, shows well. At Carbonate Center, seven miles from Trail Gulch on the Beaver, some 100 lodes have been located, which are said to be rich in silver and galena. A claim just below Trail Gulch which has only been partially prospected proves rich, the gold being coarse, one nugget weighing $42 having been found. From this claim to the mouth of the creek the ground where prospected shows fine prospects.

There are many gulches in this mining district which have never been prospected.

The Lake Creek belt of prospects is located about ten miles northeast from Ketchum and on the head of Lake and Eagle crecks. The mineral bearing belt is almost three miles in width, and appears to be the same belt which extends from Galena to East Fork of Wood River, on north side of Wood River. Three miles below the above mentioned belt, and on the east side of the lakes, is another group of mines. A good deal of prospecting is being done in both regions.

The Salmon River country, Bay Horse, Clayton, Challis, Bonanza and Custer City, the Yankee Fork country, etc., seem to be thriving and many mines are being worked. At Clayton, on Kennekinneck Creek, on the west side of Salmon, there is a 20-ton smelter, which turned out some bullion last year. The output for the season, as given in the Salt Lake *Tribune*, was 170 tons of bullion, averaging about 700 ounces silver, or a little over 120,000 ounces of silver. There was also produced seven car loads of matte, carrying 25,000 ounces of silver, making the output about $170,000. The works reduced 1,900 of ore and have 700 tons on hand. The smelter ran 60 days during the season. About 575 tons of this ore came from the Sky Lark. This ore averaged 100 ounces silver and 10 to 15 per cent copper.

According to the same authority, the Bay Horse smelter, which has one 40 and one 30-ton stack, ran nearly all last season, turning out about 80 tons of bullion per month, which went 450 ounces in silver. Besides the silver and lead bullion, some considerable copper matte and speiss was made and shipped away. The ores are "dry," having a low per cent of lead. It is proposed hereafter to use lead in the furnace, and a refinery has been added, so that soon the silver product will go out in the form of bars. The company own the Ramsborn, Post Boy, Utah Boy and River View. Near the smelter and Bay Horse very little prospecting has been done during the last six months. There are about 500 people in Bay Horse district.

During the past year the mines in the Yankee Fork country have not produced as largely as during the year 1883, but more dead work has been done, and the new strikes lately made give promise of a revival of mining matters here. The Custer mill has been running steadily, its 30 stamps turning out about $45,000 per month during the year. The ore crushed belonging to the company averaged from 35 to 40 ounces, with some little gold. This ore came from the Gen. Custer, Unknown, Summit and Badger, the latter lately leased. Of the ore worked 160 tons came from the Montana, and 300 from the Badger. The company employ about the mines and mills from 30 to 35 men. Salt costs the mill $70 per ton, and is used at the rate of six per cent of ore. The mill does excellent work and is a model silver mill.

The Charles Dickens has lain idle for several months. The Montana shipped ore which netted $26,139 at the Custer mill. The Whale, owned by Gallatien Bros. and James Hooper has been worked on a lease.

John G. Morrison, owner of the chief placer claim on Jordan Creek, has claimed that the source of the gold nuggets found on his ground must be near, and after washing the surface on part of the Washington, he sank and struck very rich gold quartz. This is believed to be one of the most important strikes ever made. The Washington lies west of the Charles Dickens, and is on the same ledge.

Other claims about Bonanza and Custer mostly lie idle for want of capital. There are many good claims which in time are destined to be heard from favorably.

Cariboo district is 30 miles from Soda Springs. Placers were found there years ago and are not yet worked out, and considerable work has been done on some few quartz claims, of which there are some 15 in the district.

Mineral district is some 25 miles north of Weiser City, and is making regular bullion shipments. The Seven Devil country is 75 miles north of Weiser City. It is expected that the placer ground there will cause a rush next spring. The Alaska copper mine has a large ledge, and there are several other large copper claims there. There is no smelter as yet.

There are some promising mines both in Spring Mountain and Texas Districts. The smelter has not been run for some time, however, for lack of ore.

The Lost river region, which we have frequently mentioned in the PRESS, is quite prosperous and many mines are being opened.

Houston is a new mineral region. The townsite of Houston is situated 95 miles from the nearest railroad station, Blackfoot, and 65 miles from Challis, the county seat of Custer county. Where, only three months ago, there was little besides a sage brush plain, may now be seen a thriving, busy town with several blocks of substantially constructed business houses and a number of streets, level as a floor, bordering which are fine residences. The Houston *Press* says: Within a circle, whose radius is 10 miles, with Houston the center, are more than 300 mines and prospects, which have been brought before the mining world during the present year. Mining here, as considered by "old timers," is but in its infancy, nevertheless, sufficient development has been made on some prospects to warrant the assertion that we have first-class mines, which will be as continuous in their yield as many of the properties both east and west of the great coast ranges.

The returns from ores extracted, in silver, copper and lead, vary in value from low to very high grade, while the deposits are immense and show no signs—even at the greatest depth yet attained—of the least diminution in highth or breadth.

On the 3d of October a 30-ton, water-jacket smelter was unloaded on a site which had been selected on the Big Copper claim, and a short time afterward it was blown in on copper ore from the Big Copper. The run was a success in every particular. The first 13 tons of bullion shipped East returned a profit of from $200 to $250 per ton. The smelter is so situated that ore can be taken from the mine, and, by means of a chute, dumped in any part of the smelter. This will be a great saving over transportation by wagon. The building put up as a shelter for the furnace and machinery was constructed with a view of accommodations for two more smelters and we are assured that two more will be put in early in the spring, thus making four smelters near Houston, for 1885.

The Philadelphia smelters in the Wood River country have four stacks with an aggregate capacity of 100 tons of ore per day, five verberatory furnaces for roasting ore, etc. They are fully equipped in every way.

A large amount of Idaho ore is shipped to Salt Lake and Omaha for reduction, so that it is really very difficult to arrive with any degree of exactness at the complete figures of production. Idaho has now a very good start. Capital has been attracted in her direction, some of the mines have proved remarkably rich. In a few years more no doubt her bullion product will be very largely increased. During the past year a special correspondent of the MINING AND SCIENTIFIC PRESS visited the camps of Idaho and wrote detailed descriptions of the mines and works. Those letters were no doubt scanned by our readers, so there is no necessity at this time of going into more details.

MONTANA.

Montana Territory, so long known for its gold mines, has come to the front as a wonderful copper producer, some of the best copper mines in the United States being within her borders. The principal camp is Butte, now famous for its many producing mines. Some of the claims made for the product, however, are greatly exaggerated, for a pamphlet issued for the New Orleans Exposition states that the "mines within three miles of Butte produced during the year 1884 more money than Arizona, Nevada or California; more than twice as much as Utah; more than Idaho and New Mexico combined, and almost as much as Colorado." This statement is absurd, as a glance at our tables of bullion production will show. In that camp, however, it is stated that the monthly pay rolls of eight of the leading companies aggregate as follows: Anaconda, $150,000; Lexington, $50,000; Parrot, $40,000; Colorado, $35,000; Moulton, $30,000; Alice, $50,000; Montana, $55,000; Silver Bow, Bell and Dexter, $60,000; Miscellaneous, $150,000; or a total of $620,000.

About 40 cars, containing 400 tons of copper ore and matte, daily leave the Butte depot destined either for Baltimore or Liverpool and Swansea. The five concentrators and smelters of Butte daily treat ore as follows: Anaconda, 500 tons; Parrott, 300; Colusa, 300; Colorado, 75; Clark's Colusa, 150; Bell, 50; or an aggregate of 1,375 tons. Copper mines not connected with reduction works produce ore daily, as follows: Liquidator, 100 tons; Mountain View, 50: Ramsdell Parrott, 25; and other mines (estimated) 75, or a total of 250 tons. The silver mills are treating ore daily as follows: Alice, 90 tons;

Lexington, 50; Moulton, 40; Silver Bow, 30; Dexter 30; Old Lexington 10; making a grand total of ore handled daily in Butte of 1,875 tons.

From a summary in the Butte *Miner* we compils the following statement of production of Butte mines in 1884:

From the Moulton the bullion is uniformly 750 fine, and the product for the year 1883 was $367,684 20. For the year 1884 the increase was almost 100 per cent, being not less than $600,000, according to the shipments of the first ten months. During the year 1884 three dividends have been declared, aggregating $80,000.

On the Bell during the past year but one furnace has been running, and 800 tons of ore per month has been the average quantity reduced. The output of the smelter in 1884 is estimated at $450,000, based on the product of the first ten months.

The Alice Company own the Alice and Magna Charta mines. The Alice properties are now producing an average of 2,400 tons of ore per month, carrying from thirty to forty ounces of silver per ton. The Magna Charta is 600 feet deep and produces 60 tons of ore daily. During the past four years the Company has paid in dividends $500,000, and is now paying $50,000 dividends each quarter.

The Montana Co. own the Colusa, which is turning out 125 tons of ore a day. On Clark's, Colusa, the output is 150 tons a day. With the exceptions of the Anaconda, the Parrot is the most extensive copper and smelting enterprise in the West. The output of the mine, which is 300 tons daily, will be soon increased to 400 tons. In the month of September, 1884, before the new concentrator and blast were started, the matte output was 1,418,975 pounds, containing 885,957 pounds of pure copper. The total matte output for the year was 14,856,323 pounds, containing 9,324,805 pounds of pure copper, the value of which, adding the silver contents, was about $1,220,000.

The Mountain View has 15,000 tons of ore on the dump. The Lexington runs at about 1,850 tons per month. The Orphan Girl, during 1884, supplied the 15-stamp Dexter mill with 30 tons of free ore daily. During the last months of the year, the bullion product was $249,000, of which $165,000 was clear profit.

A dozen men have made themselves rich out of the Gagnon. It is one of the oldest mines in the camp, and has produced since 1876, over 100,000 tons of ore, its present product being 40 tons per day.

During 1884 fully 3,000 tons of $35 ore has been extracted from the Poser mine, which embraces a section of famous Rainbow lode. For 1884 the daily product of the liquidation has averaged 100 tons of copper ore, the first-class assaying from 30 to 40 per cent, and the second-class 20 to 25 per cent, and these grades have either been shipped or smelted under contract, while the low grade ore has been allowed to accumulate on the dump until fully 20,000 tons are on hand, averaging 15 per cent, valued at $100,000. A great many other mines have produced, but space forbids mention of them all.

From the Anaconda mine, Montana's biggest copper property, during the first part of 1883, shipments of ore aggregating about 25,000 tons were made, having a value of about 45 per cent copper. Since the completion of the smelter at Anaconda, however, shipments to the east have ceased, and the product is shipped to the company's works down the valley. The new works, completed during the past year, have a capacity for treating about 500 tons daily. The plant cost over $100,000.

The *Inter-Mountain*, which gave a very complete review of the mining industries of Montana this month, in speaking of the Parrott says: The Parrott smelting works ranks as one of the most complete copper reduction plants on the continent. The vast buildings contain 6 reverberatory furnaces, 12 caleiners, and concentrating machinery, capable of dressing 300 tons of ore daily. Outside are also a number of open air roasting birs.

A very conservative estimate of the product of 1884 places the total at something over 9,000,000 pounds.

The low price of copper has naturally affected the interests of Butte, and it is probable that some of the smelters will have to close down until the price of copper is higher.

In Gallatin county there are many mines being worked. There is a 40-ton smelter in New World district, and mills in other places.

The Boulder mining region is extensive, but comparatively undeveloped.

The "East Side" mines, that is the mining districts east of the Rocky Mountains in Montana (with reference to extent and not to the bullion product) are the Ten Mile (or Red Mountain), 15 miles southwest of Helena; the Clark's Fork district, in the southeastern part of Gallatin county, and the Neihart, Maiden and Barker districts in Meagher county. Custom concentrating works of 50 tons a day capacity have been put up in Ten Mile district. There is a matte in Barker district, but it is not running. In Maidon district, the Montana mine is yielding $25,000 a month with a 20-stamp mill.

With the exception of the Montana mine at Maiden, the producing mines of the east side are situated tributary to Helena, and outside of the limits of any of the districts mentioned above. They are the Helena Mining & Reduction company's mines at Wickes; the Drum Lummon at Marysville; the Gloster, 20 miles northwest of Helena; the Gregory 20 miles southwest of Helena, and the Elkhorn, 35 miles southeast of Helena.

At Wickes the Helena M. & Reduction Co. has property paying $36,000 a month in dividends. Drum Lummon is producing at about the rate of $2,000,000 per year. The Globe yields about $500,000 each year. The Elkhorn pays about $5,000 a month dividends. The *Inter Mountain* says:

The leading quartz mines of Deer Lodge county (the county is also somewhat noted for its placer mines) are the Cable, Algonquin, Hope, Granite Mountain and Princeton. The first of them, the Cable, has produced some of the richest gold rock known, and it has already added several million dollars to the gold wealth of the world.

For several years past the Phillipsburg silver mines—principal among which are the Algonquin, Spreckled Trout, Hope, Comanche, Granite Mountain, Pyrenees, and other properties—have been rolling out a steady stream of wealth. The output of the Granite Mountain alone is now some $300,000 per year. The Hope Company is paying regular dividends. They aggregate to date about $170,000. Its output the past year has been about $100,000. All the properties mentioned are being worked successfully and with profit.

Silver lodes also abound in Moose Creek district, and valuable gold-bearing lodes in Highland, Snowshoe, McClellan, and Bear gulches.

In Southern Montana the Hecla produced about $1,000,000 in 1884. In Blue Wing, Argenta, Birch Creek districts are many paying mines.

Mining is the great industry of Madison county, its principal minerals being gold, silver, lead, copper, iron and coal. It has quartz lodes in nearly every portion of it, there being between 5,000 and 6,000 mine locations on record. Gold is its leading mineral. With the decline of the placer mining interest, quartz mining has come to the front. Among its leading quartz (gold) mining districts are the Silver Star, Red Bluff, Wisconsin creek, Meadow creek, Sheridan, Iron Rod, Hot Springs, Alder and Summit.

The silver mines are principally in the Potosi district, forty miles north of Virginia City, where some twenty-five mines show rich prospects, the ore, it is stated, assaying in some cases from 100 to 30,000 ounces silver to the ton. There are also some copper prospects in the county, coal discoveries, and large deposits of iron.

The gold and silver received at the Helena assay office for the year was as follows for each quarter:

1	$104,179.72
2	123,434.11
3	364,758.28
4	310,645.41
Total	$903,017.52

The Alice, Original, Lexington and Moulton are the dividend payers of Butte; and elsewhere in Montana the following are paying dividends: Boston, Montana, (near Helena); Hecla, (at Glendale); Hope, (at Phillipsburg) and Elkhorn, (Jefferson county).

NEVADA.

For many years Nevada headed the roll of bullion producers, but the palmy days of the immense production of the wonderful Comstock have passed, and the bullion yield has gradually fallen off. In 1883 Nevada took fourth place. In 1884 she takes fourth place on the list, but shows a gain over 1883 of $110,318—a small amount to be sure, but still a gain. A product of nearly nine millions from what some people call a played-out mining region is pretty good, especially as it is far ahead of some regions supposed to be exceedingly properous from a mining point of view. Storey county, where the Comstock is located, shows the following bullion product for 1884:

VIRGINIA MINING DISTRICT.

Andes	$1,722.00
Ophir	81,841.77
Potosi	200,000.00
Savage	13,058.00
Union Consolidated	5,065.13
Gould and Curry	19,206.18
Hale and Norcross	102,712.02
Mariposa Mill	21,890.30

GOLD HILL DISTRICT.

Belcher	380,243.73
Crown Point	539,522.73
Kentuck	370,364.37
Yellow Jacket	650,915.00

THE CANYON MINES.

Monte Cristo	23,350.34
Lady Bryan	9,934.50
Total	$2,432,884.58

The most notable event in the history of the Comstock last year was the abandonment of the lowest levels after long and patient prospecting under adverse circumstances. Nothing was found to warrant a continuance of these prospecting operations, and the machinery, etc., was removed, so that the lower levels were allowed to fill up. They are now prospecting at points less deep, and looking for ore bodies they may have passed in the race for depth. Some of the miners are even prospecting only a few hundred feet deep, searching out small lots of ore that in former days would not pay to work. Vigorous prospecting is going on in all directions.

The bullion product of the Comstock was, as stated in the preceding table, $2,432,884.58 for 1884. The assessments levied on the Comstock mines in the same time aggregated $2,930,85, so the mining was done at a loss. To show the expense attending the mining operations on the lode, the pay-roll of some of the mines in December last is given:

Utah	$2,400.00
Sierra Nevada	2,650.75
Union Consolidated	4,325.00
Mexican	2,021.00
Ophir	8,008.50
Con. California and Virginia	7,162.50
Union Shaft	7,562.25
Savage	1,174.00
Hale and Norcross	5,326.00
Crown Point	12,777.00
Belcher	10,580.00
Combination Shaft	18,265.00
Total	$82,551.00

On the 1st of January, 1885, the various Comstock companies stood financially as follows:

CASH ON HAND.

Alpha Con	$4,781.42
Best and Belcher	34,538.14
Belcher	15,094.13
Challar	34,541.10
Crown Point	21,367.45
Exchequer	1,008.82
Gould and Curry	43,035.05
Mexican	11,803.98
Ophir	7,883.47
Occidental	2,892.88
Sierra Nevada	27,494.95
Savage	16,878.58

INDEBTEDNESS.

Hale and Norcross	37,351.66
Potosi (overdraft at bank)	2,107

The Surveyor General of the State, General Preble, in his report says: Any section of European country that had produced $180,000,000 of silver and $145,000,000, of gold in 20 years, as the Comstock has, and disbursed as dividends $120,000,000, besides disbursing $4,000,000 annually in wages, would be fostered and encouraged in its production by the General Government, and would be looked upon as a mainstay to the financial market of the world. The Government, however, seems to regard the matter as of no consequence. Outside the Comstock, nearly $100,000,000 more have been produced in the State, adding to the tangible wealth of the world over $425,000,000 in silver and gold. This is from assessors' reports; true reports would show nearer $600,000,000, as a vast amount has been produced of which no reports were ever made. Instead of building up the State and benefiting it, the wealth produced has been used to retard its progress. It has been taken away to beautify other countries, to astonish foreign courts by the garnish grandeur, vulgarity, and lack of interest of its possessors. It has laid foreign cables and built up papers that to-day decry it to the world as a tax-ridden, poverty-stricken monstrosity that even the crows and scorpions are emigrating from. It has retarded legislation to encourage farming, grazing or any other interests of permanency. It has centered itself within itself, taken wings and left us with hundreds of miles of holes in the ground to be filled with water or to be utilized as best we may, and still we survive. We not only survive, but we flourish. The State produced $7,000,000 of gold and silver in 1884 and sold 85,000 acres of land in the face of all opposition from the outside. Property is not taxed high in most of the counties of the State. The rate may be high, but, with the exception of Storey county, the valuation is low.

There are many facts, however, which indicate a renewal of interest in the mining industry of the State. The *Silver State* thus summarizes them: For several years past the population of our State has been steadily decreasing, a loss that is mainly attributable to the gradual decline of our mining industry. The decline along the Comstock had its reflection, and every mining district in the State, no matter how promising its prospects, was affected in a corresponding degree. The effect then produced has never been overcome, a fact which has given birth to the idea that Nevada mining properties are worked out, and that another season of prosperity will never come through the medium of the mines. The development that is constantly going on, and the discoveries that have followed have demonstrated most conclusively that this impression is groundless, and that proper encouragement, and the removal of certain contingencies under which the mining fraternity labor, will build up our now lagging industry, and activity and consequent prosperity will come again. Numerous instances can be cited corroborative of the fact that practically abandoned mining camps have been brought back to life by energy and perseverance, and are to-day heavy bullion producers. Tuscarora is a fair representation of this class of mining camps. A few years ago it was generally considered "worked out," but subsequent development has established the fact that its future may be even more prosperous than its past. It is unnecessary, however, to cite instances so far from home. Those who are familiar with the mining history of this county can recall parallel instances that have taken place in this immediate neighborhood. Two years ago the Paradise mine was practically abandoned—in fact, was considered worthless by former operators—but energy and mining ability have had their effect, and to-day it is one of the most promising mines in the State. Other properties in the same neighborhood only require the same determined energy and requisite capital to bring them out. Willow Creek district has had its struggle, but capital has at last become interested in its development, and the result that has followed has been of the most encouraging character. This district certainly offers as fine inducements as a mining man can desire. Among the numerous locations that have been made in this mineral belt, quite a number only require capital to make them paying propositions. Instead of worked out mining districts, the fact of the matter is that Nevada has just as fine mining opportunities as it ever had. Honest representations will have their effect, and though it will take time to accomplish the end, the day will come when our promising but now idle enterprises will receive the attention they justly deserve.

In other portions of this review will be found the statistics of assessments and dividends from Nevada mines for the year 1883. The assessments foot up $3,631,350, and the dividends, only $193,500. These are from incorporated companies. No doubt, however, as in other places, many mines have paid a profit, of which no public record has been made.

Eureka district has suffered somewhat from the low price of lead, yet the yield of its principal mines has been large. During the year 1884 the Richmond Mining Company, of Eureka district, shipped through Wells, Fargo & Co., bars of precious metal containing $357,884.92 in gold, and $595,914.01 in silver. Owing to the depreciated value of lead, only 1,829 tons were shipped by the company. During the same period the Eureka Consolidated Company shipped gold and silver in 1,363 tons of lead, to the value of $466,722.20.

Extensive improvements are being made at Eureka, by the Eureka Consolidated Co. The old smelters are being torn down, and a new one constructed, so as to give the company more dumping space. This will allow them to reduce their ores more systematically, and at a reduced cost. The improvements will not only be of benefit to the company, but to the people

of the camp at large, and particularly to the owners of small mines, who will have competition in the sale of their ores. The Eureka Con. Co. will receive custom ores during the time that the improvements are going on, and will have large quantities on hand when they are ready for smelting, which will be in about six weeks. The new smelter is to he located on the side of the hil, that others can be readily and conveniently added to it as the requirements of the company may demand.

From Eastern Nevada, during the year 1884, the Geddes and Bertrand Mining Company shipped through Wells, Fargo & Co., 38 hars of hullion, weighing 2,849 pounds, and valued at $40,250. During the same period the Tyho Company shipped 9 hars, weighing 1,130 pounds, and valued at $13,100. Miscellaneous shipments to the value of $16,338.52 were also made.

The Pioche *Record* states that the Bullionville Smelting Company, at present engaged in leaching the residue tailings, of which they own some 300,000 tons, have, in this, their first lixiviation test hy the Russell process, scored a grand succcss; a success that places the enterprise beyond the realm of the experimental, to that of a sound and paying hasis.

The districts along the Carson and Colorado railroad are heing slowly developed, but no very important changes have heen made in the year.

Nevada produces considerahle salt, some sulphur and various other mineral products, no account of which is taken in her figures of mineral yield.

NEW MEXICO.

The bullion production of New Mexico in 1884, was $3,660,614, a gain of $247,095 over the previous year. In some localities in the Territory there have heen gains, in others losses, hut the aggregate shows the gain mentioned. The general dullness prevailing has affected the mines of New Mexico as it has other regions. Market values of lead and copper have been low. Until within the last twelve months mines were numerously worked for their joint prodnct of lead and silver or copper and gold that are now or have for months heen idle hecause of the prevalent low figures for baser metals. The stoppage of these and the overproduction of lead and copper, notwithstanding has been the chief cause of the mining depression that has shown itself so generally and which has kept from the districts and camps of the country the capital that is wont to look for iuvestment therein. The Silver City *Enterprise* says:

There are few who will dispute the assertion that in Grant county the past year has been one of real progress. The figures show this. They show that we are not arguiug from false premises when we state that the county is in a hetter mining condition to-day than has ever been the case heretofore. There are more mines producing gold and silver in operation now than there were a year ago, and in a year from the present time the numher will be materially increased. The falling off in the total of the county is due to two cases: First, the cutting off of Kingston by the creation of the new county of Sierra, and second, the suspension of operations at Santa Rita, San Jose and Ivanhoe. The prodnct of the latter camps has heon chiefly copper and a species of silver-lead ore, which, through the cause mentioned, in a preceding paragraph it has not been profitable to mine.

The gold and silver properties of the county show a decided gain upon the whole. Most of the regular producers lahored under severe disadvantages during the greater portion of the year. This was notably the case with the Bremen mine and the Georgetown properties, while several of the best camps in the southern portion of the county showed hut little activity during the year. The mines at Gold Gulch and Gold Hill have accomplished a great deal in the way of taking out ore, but only a small quantity has been shipped away. The totals which we give are prepared from figures furnished us by the owners and superintendents of properties, and are in almost every instance absolutely correct. There has been a disinclination on the part of many to have their mines particularized, in consequence of which there is an absence of detail that might otherwise prove interesting.

As was the case in 1883, the camps whose busiuess is directly tributary to Silver City, and which fairly entitles them to be termed

Silver City Mines

Are in the lead. They comprise the Bremen and otber Chloride Flat mines, the mines at Fleming, Bullard's Peak, Pinos Altos, Telegraph and those at Bald, Bear and Lone mountains. To the total of the product of these has also heen added the bullion hougbt hy the hanks of this city. The yield for the year aggregates the snm of $376,836.29. Of that amount the Bremen mine produced $125,528.16 and the Old Man mine $94,430.13, the balance being distrihuted among the others mentioned. The Bremen mine, as is well known, has heen operated to a limited extent only, while the mill has heen running scarcely more than half the time. The Old Man yield is the result of work from the 2d of June to the first of the year, a period of only seven months. It is estimatcd that there is on the dumps of the Old Man ahout 15,000 tons of ore valued at $20 per tou, a total of $300,000. This will be treated at the mill which the company intends putting up. When it is considered that our two leading mines were active for but little more than half the time, it will he seen that there is no cause to anticipate a decrease in the future annual outputs of the mines here.

Georgetown Mines

have made a very appreciahle increase during the year. The close of 1883 witnessed a very discouraging state of affairs there, and it looaed at one time as though tbere would he a very great falling off in the silver yield. The resumption of work upon the Mimbres mining company's property, together with the excellent showing made hy the Commercial mine during the year, rehabilitated the camp upon its former prosperous hasis. The total value of the ore produced, was $288,627. The average value of the ore shipped from the Commercial mine to Socorro during the year was $245 per ton. Of the total accredited the Georgetown, the Mimbres company produced $161,000. The company handled 18,000 tons of ore since the 1st of July, at which time Mr. Pheby took charge.

The Southern Camps

which comprise Carlisle, Victorio, Eureka, Pyramid, Shakspeare, Gold Gulch, Gold Hill, Tres Hermanas and Floridas, show an increase over 1883. This is in spite of the fact that in several instauces there has heen almost nothing done. The total for the camps mentioned amounts to $529,000. The outlook for the mines in this portion of the county is very flattering, and tbe recent discoveries at Gold Gulch and Gold Hill must certainly augment during the coming month the aggregate yield.

Cook's Peak

has shipped 126 tons of ore, the value of which was $5,100.

Santa Rita

figures last year as a producer of iron ore which is used for fluxiug purposes by the Benson smelter. Five thousand tons, valued at $5 per tou on the dump, it amouuted to $25,000.

Recapitulation.

Silver City mines	$376,863 29
Southern camps	529,606 00
Georgetown	288,657 00
Cook's Peak	5,100 00
Santa Rita (iron ore)	25,000 00
Total	$1,224,560 29

As compared with the yield of 1883, there is a difference in favor of that year of $307,863.90. Kingston has in all likelihood more than produced the difference, so that instead of there being a falling off, as is apparent at first glance, the county has in reality made a small gain. One of the important factors in the make-up of the estimate for 1883 was the aggregate yield of Santa Rita, San Jose and Ivanhoe, which amounted in all, to $150,298.11. In the year just passed, they accomplished nothing in the way of ore shipment, save the iron noted. It will he seen, therefore, that the gold and silver yield of the county is on the increase, and that that fact is one which argues greatly in favor of the county's future as a producer of the precious metals.

UTAH.

While Utah heads the list of all the States and Territories as far as mining dividends are concerned, it scores numher five in the roll in considering the aggregate product for the year. Lead plays a conspicuous part in her total product. This metal has seen so low a price of late that it materially reduces the net value of the product of the Territory. Indeed, some of the smelters will probably close down for a time unless the price of lead improves. There are many districts and mines in Utah, and we can in this issue give only a cursory glance at the more prominent ones, want of space preventing any extended mention such as the mines really warrant. The Salt Lake *Tribune*, in its annual edition, gave very exhaustive accounts of the districts and mines, presenting very full reports from most of them. We compile from that source what information we are ahle to present to our readers.

The tahles of hullion production of Utah, which are printed on page 54 of this numher of the PRESS, shows a marked annual increase in the percentage of gold and silver produced in the manufacture of hase bullion. It demonstrates conclusively that the process of smelting is in the ascendant for the reduction of ores, and that any causes tending to decrease or discourage smelting operations in the Territory, will produce a corresponding decrease iu the gold and silver production west of the Missouri river.

Our table of total hullion output for twelve months, exclusive of ore, figures up as follows:

January	$449,228.74
February	364,606.47
March	469,366.66
April	432,809.44
May	343,416.16
June	539,532.90
July	530,978.35
August	526,393.33
September	522,283.49
October	532,886.61
November	545,018.88
December	609,511.26
Total	$5,856,532.64

The actual output, as given hy Mr. Dooly with approximate exactness, was $7,389,836.90, or at seahoard valuation $9,301,508. The difference hetweeu the two is mainly made up hy operations which make no reports save at the end of the year.

The Horn silver mine, which has paid out $4,000,000 in dividends, has hoisted 210,000 tons of $50 ore from a chimney 800 feet deep. Since February, 1876, it has put out 192,652 tons of ore, which produced 120,282,970 lbs. of lead, and 6,552,992 ounces of silver. Previous to that time, Campbell, Cullen & Co., and the Frisco Smelting Company, had smelted 16,299 tons, easily good for 13,462,000 lbs. lead, and 807,453 ounces silver, net. A total of 209,251 tons of ore, yielding 133,744,970 lbs. lead, and 7,360,445 ounces silver, net. Rating lead at two cents a pound in Salt Lake, and silver at $1.08,1879-1884, worth $10,624,179; per ton, $50.77. The output of the company's smelters, rising 6,000 tons of base hullion, sold the lead in Chicago, the silver in New York, for $9,561,336.81. That of 1884 will make it about $12,000,000. Cost of mining, smeltiug, refining, and transportatiou East, must, of course, come out of this. Cost of refining in Chicago is about $8 a ton.

Shipments of orc to the smelter have lately heen reduced, on account of the decline in gold and silver, and there is talk of shutting down for some months.

The most important mine heing worked at Big Cottonwood district now is the Maxfield, which is shipping ore, though the grade has been low.

The Stormont mines, at Silver Reef—the Sandstone district—from July, 1879, to Nov. 3, 1884, yielded 74,300 tons of ore, which produced 1,404,976 ounces fine silver, averaging 18.9 ounces per ton; dividends, $145,000.

At Tintic the Eureka yielded last year 16,000 tons of $20 ore. The Beck Bullion and Champion yielded together 6,800 tons. The Northern Spy shipped 700 tons; Mammo.h Copperopolis, 800 tons; other mines, 327 tons.

At the Oneida placers a ditch is heing put in, and when the water is in they expect to clean up a million a year.

The Christy M. & M. Co. at Silver Reef comprises 23 claims. The Christy commenced developing and working the property January 1, 1878. The total gross hullion propuct was

For 1878	$302,536 81
" 1879	240,466 37
" 1886	272,084 45
" 1881	316,039 46
" 1882	372,436 10
" 1883	262,310 60
" 1884 (10 days)	5,276 76
900 bars valued at	$1,776,134 64

Active operations were suspended hy the Christy Mill and Mining Company in January, 1884, on account of the high rate of wages and cost of supplies. Both have since heen materially reduced, correspondingly reducing the expense of operating the mine and mill.

The Calumet and Hecla group at Stockton has very low grade ores, and they are concentrating them.

The Brokolyn, the great lead barhonate mine at Bingham, is shipping 600 tons of first-class ore and 100 tons of concentrates a month.

The lead mine in Bingham is turning out 10 tons of 50 per cent lead ore per day, and 70 tons of 18 per cent orc. The smelting works produced in 1884, 6,480 tons of hullion, carrying 110 ounces silver and 320 ounces gold per ton.

The output of the Yosemite mine for 1884, 1,900 to 2,000 tons of ore.

The old Telegraph, at Bingham, yielded (under lease) 5,553,860 pounds of ore. The Nast shipped 1,056,220 pounds; and the Saturn, 306,720 pounds. Other mines aggregated shipments of 2,225 tons. From this district the total shipments were ahout 25,000 tons.

The Crescent mine, at Park City, is a paying mine. The following comparative statement of ores sold from the Crescent mine in 1883 and 1884, receipts on account of, dishursements, cost and profit per ton, etc., is from repor s made to the stockholders hy officers of the company, to wit:

	1883.	1884.
Tons of ore sold	11 574	12,748
Received for same	$346,148.49	$145,664. 2
Received per ton	29.92	11.27
Total cost of	$193,908 95	$162,545.39
Cost per ton	16.77	12.75
Total profits on	$152,239.54	$83,120.63
Profit per ton	13.15	6.52

The value was $3 per ton less in 1884 hecause of the lower price of lead. There was still a reduction in grade, however, perhaps due in part to less careful selection, of $7.65 per ton, or ahout 25 per cent. More than half of this loss was made up hy

The Ontario (Utah) "hoss" mine has dishursed some $6,000,000 in dividends in eight years. There were sold and treated in 1884, 24,872 tons of dry ore, which realized $2,060,241.96. From the organization of the Ontario S. M. Company, and the starting of their mill February 1, 1877, to Decemher 31, 1884 (part of Decemher estimated), 137,316 tons of dry ore have heen reduced and sold, the product of which sold for $13,539,981.69. Prior to that the Ontario M. Company had realized $1,014,596.96, representing, assuming that the ore graded the same as all the ore since, 10,290 tons of dry ore. The total output of the mine to date is therefore 147,606 tons of dry ore, realizing to the company $14,554,578 65—$98.60 per ton. The mine paid its 102d dividend of 50 cents per share—64 on 100,000, 38 on 150,000 shares—in all $6,050,000, December 31, 1884; $51 per share on the old shares, $19 on the new shares.

The mines mentioned comprise the principal bullion producing properties in Utah, but there are thousands of others heing developed. Utah produces also iron, coal, and many other minerals. Her future possihilities are great Salt Lake has become a great ore market, and receives much ore from Idaho. That Territory and Montana are in a degree tributary to Salt Lake. We regret that space forhids our giving more space to a description of the mines, reduction works, etc., in Utah.

WASHINGTON AND OREGON.

As producers of precious metals, neither Oregon nor Washington cut much figure, as compared with the other regions. Therc are many placer mines in Oregon, however, which are paying very well. The quartz mines are being worked also, but no very remarkable ones have heen opened. Oregon has many coal mines which are productive, and one nickel minc not yet developed, however, sufficiently to show its work.

Washington Territory has several good coal mines, which send their product to this market. The gold product of the Territory, given on our bulletin tahles, is small.

Assaying.

There will shortly he issued by Dewey & Co., puhlishers of the MINING AND SCIENTIFIC PRESS, a work on Assaying, hy C. H. Aaron. It is now in press and nearly completed. The work comprises parts 1 and 111 of the subject, part 1—"Gold and Silver Ores," having been published last year. The forthcoming volume, which contains the resume and third parts, and an appendix, is devoted to "Gold and Silver Bullion," and "Lead, Copper, Tin, Mercury, etc." Like previous volumes edited hy Mr. Aaron, the new work is eminently practical in its character and the result of personal observation and experience. It is plainly written, so that any miner, prospector, or assayer can understand it without scientific chemical knowledge. The volume is small and clearly printed, with suitable illustrations, and will be sold for $2.

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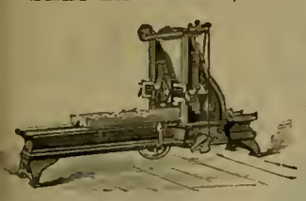

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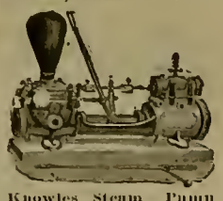

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Mining Dividends.

On page 54 is given a series of tables of the assessments on mines levied during 1884. The assessments aggregate $4,724,700 as against $5,885,784 in 1883. The incorporated mines in eleven States and Territories in 1884 distributed as dividends $9,185,000. There are thousands of paying mines, however, which do not appear on the list, for they are owned by private individuals who have no reason to state the product. The largest amount in dividends came from four mines in Utah, two of which—the Horn Silver and Ontario—paid out 20 per cent of the grand total. California reported more incorporated dividend-paying mines last year than any other State, and the aggregate amount of the disbursements was the next largest from all sources. The six incorporated copper mines of Michigan paid nearly as much as the twelve incorporated silver dividend mines of Colorado. The Arizona mines did poorly last year. Nearly one-third of the total from the fourteen California mines last year came from the Plymouth Consolidated of Amador county. This mine also contributed a third of the amount paid by thirteen California mines in 1883. The Small Hopes mine in Colorado paid over 60 per cent of the combined total of the twelve mines in that State. Yet the Small Hopes was entirely unknown as a dividend proposition prior to March, 1884. The dividends of the Michigan copper mines fell off one-half last year as compared with 1883. The Montana mines nearly doubled their dividends. The Nevada and New Mexico mines fell off more than one half. The Utah mines show an increase of nearly 40 per cent.

The *Bulletin* gives the following table of dividends for 1884:

ARIZONA.

	Dividends.	Amount.
Contention Consolidated	1	$62,500
California	1	8,500
Copper Queen	2	200,000
Silver King	2	50,000
United Verde	1	60,000
Vizinia	1	5,000
Totals	8	$385,000
In 1883	18	1,109,000

CALIFORNIA.

	Dividends.	Amount.
Bird's Eye Creek	2	$11,250
Bodie Consolidated	6	269,265
Bonanza King	6	150,000
Bulwer Consolidated	1	10,000
Derbec Blue Gravel	6	60,000
Idaho	12	244,900
Mt. Pleasant	1	15,000
Oro Grande	10	174,360
Quicksilver	1	128,730
Plymouth Consolidated	12	600,000
Plumas Eureka	2	123,947
Sierra Buttes	2	30,376
Standard Consolidated	3	75,000
Syndicate	6	60,000
Totals	70	$1,953,337
In 1883	48	1,009,976

COLORADO.

	Dividends.	Amount.
Adams	5	$82,500
Bassick	1	100,000
Bullion	2	10,000
California	1	32,500
Catalpa	1	30,000
Carbonate Hill	2	20,000
Chrysolite	1	50,000
Dunkin	1	10,000
Iron Silver	1	100,000
Little Chief	2	40,000
Morning Star	1	25,000
Small Hopes	14	850,000
Totals	32	$1,350,000
In 1883	31	1,200,750

DAKOTA.

	Dividends.	Amount.
Big Bend Hydraulic	12	$72,000
Father De Smet	10	200,000
Homestake	11	306,250
Totals	34	$578,250
In 1883	18	645,000

MONTANA.

	Dividends.	Amount.
Alice	3	$150,000
Hecla Consolidated	12	180,000
Helena Mining & Reduction	1	36,000
Hope	3	33,912
Lexington	4	345,000
Montana	2	146,000
Moulton	3	80,000
Original	9	27,000
Totals	37	$997,912
In 1883	39	513,324

MICHIGAN.

	Dividends.	Amount.
Atlantic	1	$40,000
Calumet & Hecla	2	800,000
Central	1	40,000
Franklin	1	80,000
Osceola	4	87,500
Quincy	2	280,000
Totals	11	$1,327,500
In 1883	12	1,670,000

NEVADA.

	Dividends.	Amount.
Jackson	2	$10,000
Kentuck	7	21,000
Navajo	2	50,000
Paradise Valley	5	50,000
Richmond Consolidated	1	62,500
Totals	17	$193,500
In 1883	25	584,000

NEW MEXICO AND VERMONT.

	Dividends.	Amount.
Sierra Belle (N. M.)	1	$30,000
Sierra Grande (N. M.)	2	160,000
Rooks (Vermont)	3	21,000

UTAH.

Cosmopolitan	1	$25,000
Honorine	1	12,500
Horn Silver	4	1,200,000
Ontario	12	900,000
Total	18	$2,137,500
In 1883	13	1,582,000

Recapitulation.

Annexed is a condensed statement of the above dividends, showing the number of mines contributing to the grand total:

	Mines.	Dividends.	Amount.
Arizona	6	8	$386,000
California	14	70	1,953,337
Colorado	12	31	1,350,000
Dakota	3	34	578,250
Michigan	6	11	1,327,500
Montana	8	37	997,912
Missouri	1	2	40,000
Nevada	5	17	193,500
New Mexico	3	3	190,000
Utah	4	18	2,137,500
Vermont	1	3	31,000
Totals	64	234	$9,184,999
Mexico	2	5	277,675
Total	64	239	$9,462,674
1883	66	238	10,130,050
1882	64	331	13,308,150
1881	60	342	13,653,400

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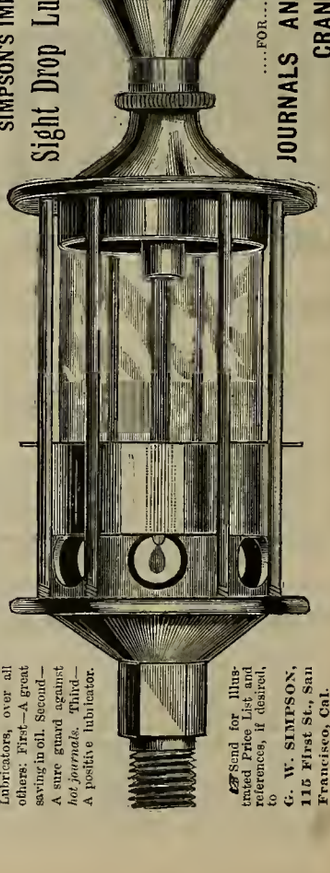

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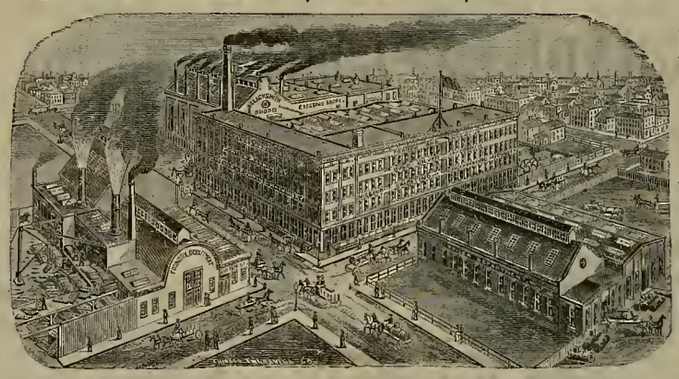

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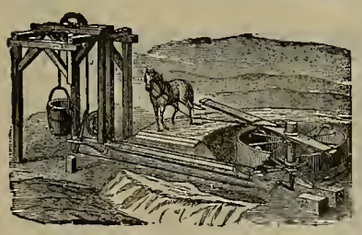

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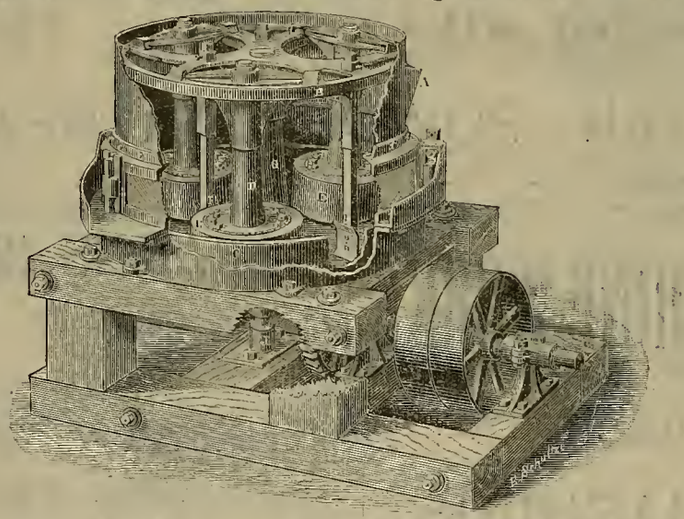

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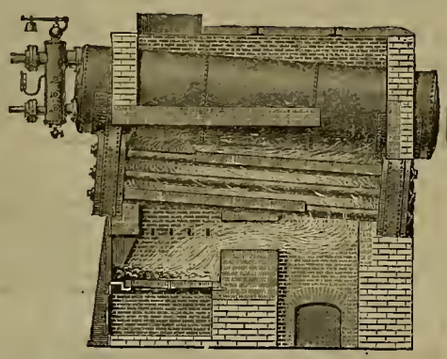

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Risdon Iron and Locomotive Works—Dear Sirs: I am using one of your Heine Patent Safety Boilers in my Candy Factory on Twenty-Third street, near Valencia. For economy of fuel, safety and efficiency I have never seen its equal. Very truly yours,
(Signed) W. S. TOWNSEND.

Send for Circular and Prices.

THE CALIFORNIA POWDER WORKS.

MANUFACTURERS OF

Sporting, Cannon, Mining, Blasting and

HERCULES POWDER

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

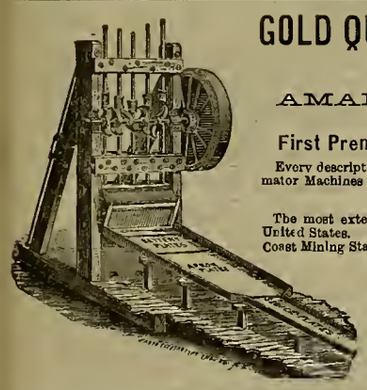
No. 1 (XX) is the Strongest Explosive Known.
No. 2 is superior to any powder of that grade.

PATENTED IN THE UNITED STATES PATENT OFFICE.

ORDERS RECEIVED FOR HERCULES CAPS AND FUSE.

JOHN F. LOHSE, SEC'Y.

Office, No. 230 California Street - - San Francisco, Cal.



GOLD QUARTZ and PLACER MINERS.

Silver Plated

AMALGAMATING PLATES,

For Saving Gold.

First Premium Awarded at Mechanics' Fair, 1884.

Every description of plates for Quartz Mills and Wet or Dry Placer Amalgamator Machines made to order, corrugated or plain.

OVER 2,000 ORDERS FILLED.

The most extensive and successful manufacturer of these plates in the United States. Will fill orders for delivery in Rocky Mountain and Pacific Coast Mining States at lower prices than any other manufacturer.

Old Mining Plates Replated. Old Plates bought or gold separated for low percentage of result.

SEND FOR PRICE LIST.

SAN FRANCISCO PLATING WORKS,

653 & 655 Mission St., San Francisco Cal

E. G. DENNISTON, Proprietor.

THE CONSUMERS' COMPANY.

VULCAN B B AND AJAX.

The Best LOW GRADE EXPLOSIVES in the Market.

☞ SUPERIOR TO BLACK OR JUDSON POWDER. ☜

Vulcan Nos. 1, 2 and 3,

The Best NITRO-GLYCERINE POWDERS Manufactured.

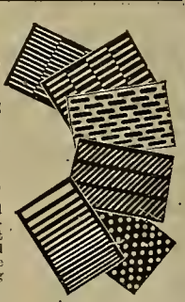
SPECIAL INDUCEMENTS IN PRICES.

AJAX and VULCAN B B POWDERS are Unequaled for Bank Blasting and Railroad Work.

Caps and Fuse of all Grades at Bottom Rates.

VULCAN POWDER CO.,

18 California Street, San Francisco, Cal.



Chicago Prices Beaten!

ESTABLISHED 1860.

S. F. PIONEER SCREEN WORKS,

32 Fremont St., San Francisco.

J. W. QUICK, Prop'r.

Sheet Metals of all kinds perforated for Flour and Rice Mills, Grain and Malt Driers, Furnaces, Chess, Cement and Smut Mills, Separators, Revolving and Shot Screens, Stamp Batteries, and all kinds of Mining and Milling Machinery. Inventor and manufacturer of the Celebrated Slot Cut and Slot Punched Screens. Mining Screens a Specialty, from No. 1 to 15 (fine).

☞ Orders Promptly Executed.

PAT. OCT. 25, 1881.

PERFECT PULLEYS

First Premium Awarded at Mechanics' Fair, 1884.

CLOT & MEESE,

Sole Licensed Manufacturers of the

Medart Patent Wrought Rim Pulley

For the States of California, Oregon and Nevada, and the Territories of Idaho, Washington Montana, Wyoming, Utah and Arizona. Lightest, Strongest, Cheapest and Best Balanced Pulley in the World. Also Manufacturers of

SHAFTING, HANGERS AND APPURTENANCES.

☞ SEND FOR CIRCULAR AND PRICE LIST. ☜

Nos 129 and 131 Fremont Street - - - SAN FRANCISCO, CAL.

JENKINS PATENT VALVES.

Gate, Globe, Angle, Check and Safety.

Manufactured of BEST STEAM METAL. We claim the following advantages over other Valves and Gauge Cocks now in use:

1. A perfectly tight Valve under any and all pressures of steam, oils or gases.
2. Sand or grit of any kind will not injure the seat.
3. You do not have to take them off to repair them.
4. They can be repaired by any mechanic in a few minutes.
5. The elasticity of the Disc allows it to adapt itself to an imperfect surface.

In Valves having ground or metal seats, should sand or grit get upon the seat it is impossible to make them tight except by regrinding, which is expensive if done by hand, and if done by machine soon wears out the valve, and in most cases they have to be cut connected from the pipes, often costing more than a new valve. The JENKINS Disc used in these Valves is manufactured under our 1880 Patent, and will stand 200 lbs. steam. Sample orders solicited.

To avoid imposition, see that Valves are stamped "Jenkins Bros." For sale by

DUNHAM, CARRIGAN & CO., San Francisco, Cal.

GOLD MEDAL AWARDED

—AT—

Mechanics' Fair, 1883 & 1884

—FOR—

Automatic Cut-Off Engine.

SILVER MEDAL AWARDED

—1883—

For Best Hoisting Engine and Boiler Combined.

W. H. OHMEN,

Machine and Engine Works

109 & 111 Beale St.

SAN FRANCISCO.

REGISTER YOUR

TRADE

MARKS

Through DEWEY & Co.'s Scientific Press Patent Agency, No. 252 Market St., cor. Front, S. F

Market Reports.

Lumber at Wholesale.

The market has been moderately active, though receipts have been light of late. Quotations of cargo rates are as follows for redwood lumber, for delivery at San Francisco, Oakland, Alameda, Berkeley, Vallejo, Benicia, Port Costa, Martinez and Antioch:

ROUGH—No. 1 rough merchantable, $18; No. 2 (refuse) rough, $14; No. 1 rough boards (specified width, 10 inches and over), $19; No. 2 (refuse) do do do, $14; No. 1 rough lumber, surface one side, $21; No. 2 (refuse) do do do $18.

PICKETS—Rough square pickets, $12; rough pointed do, $14; fancy pointed do, $22.

HALF-INCH LUMBER—No. 1 ½-inch surfaced, board measure, $40; No. 2 do do do, $39; No. 3 do do do, $38; No. 4 (refuse) do do do, $32; No. 1 ½-inch battens, board measure, $40; No. 2 (refuse) do do do, $32; No. 1 ½-inch siding, 12 ft. and over, b m, $40; No. 2 (refuse) do do do $32; ½-inch siding, under 12 ft, $32.

RUSTIC—No. 1 Rustic, 1x10, 12 ft and over, $33; No. 2 do do do, $32; No. 3 do do do, $31; No. 4 Rustic, 1x10, $28; No. 5 (refuse) do do do, $21; No. 1 Rustic, 1x8, 12 ft and over, $31; No. 2 do do do, $30; No. 3 do do do, $29; No. 4 Rustic, 1x8, $26; No. 5 (refuse) do do do, $21.

CLEAR—No. 1 surfaced and rough clear, $32; No. 2 do do do, $31; No. 3 do do do, $30; No. 4 (refuse) do do do, $24; No. 1 surfaced and rough clear, 1x8 and 1x6, $30; No. 2, do do do, $29; No. 3 do do do, $23; No. 4 (refuse) do do do, $24.

[Dimensioned, Surfaced and Rough Clear (widths and lengths), 12 inches wide and over, add $1 ₱ M (on each corresponding grade) to the above list price of "Clear."]

TONGUED AND GROOVED—No. 1 T and G, 1x4, 12 feet and over, $32; No. 2 (refuse) do do do, $24; No. 1 T and G, 1x6, 12 ft and over, $30; No. 2 (refuse) do do do, $24; T and G, 1x6, 7 to 11 ft, $20; do do, under 7 ft, $23.

TONGUED, GROOVED AND BEADED—No. 1 T, G and Beaded, 1x4, 1¼x4 and 1¼x0, 12 ft and over, $32; No. 2 (refuse) do do do, $24; T, G and Beaded, 1x4, 1¼x4 and ¼x6, 7 to 11 ft, $27; do do, under 7 ft, $22.

ROUGH CLEAR—1x6 and under in width, and under 12 ft in length, $24.

[On a credit of 60 days, or a discount at the rate of 1 per cent per month for anticipated payments, and not less than 1 per cent per month added for extension of the same].

We quote cargo rates—Pine—Merchantable Rough, $15 ₱ M; Flooring, $24.20; Stepping, $37 ₱ M; Redwood—Merchantable Rough, $18; Surfaced, $32; Rough Clear, $32; Rustic, $33; Tongued and Grooved, $30; Tongued, Grooved and Beaded, $32.

Lumber at Retail.

Retail quotations for pine, fir and spruce are as follows:

ROUGH MERCHANTABLE—(Ordinary sizes) to 40 feet long, per M ft, $22.50; Rough Merchantable, 1x6, Fencing, $22.50; do do, 1x4, do, $23.50; do do, 1x3, do, $24.50; do do, 1x4, odd lengths, $22.50; do do, 1x6, do $21.50; do No. 2, all sizes, $18.50; do Selected, $26.50; do Clear, other than for T and G and Stepping, $31.

[Rough Clear for T and G and Stepping $1 ₱ M less than price of kind for which intended.]

Dressed T and G Flooring, 1x6, No. 1, vertical grain, ₱ M ft, $38.50; Dressed T and G Flooring, 1x6, No. 1, $33.50; do do do, No. 2, $28.50; Dressed T and O Flooring, 1x3, 1x4, 1¼x4 and over, No. 1, vertical grain, $40.50; do do do, No. 1, $35.50; do do do, No. 2, $29.50; Dressed Stepping, No. 1, vertical grain, $42.50; do do, No. 1, $37.50; do do, No. 2, $28.50.

SPRUCE—Rough Merchantable, ₱ M ft, $21.50; do Clear, $35; Clear Dressed (shelving), $40; Pickets (rough) board measure, $20.50; Furring, 1x2, per lineal ft, 1c; Laths, 1 and 1-inch, ₱ M, $3.50; 1½-inch, $4.

[N. B.—For all sizes over 14 inches, and lengths over 40 feet, extra rates].

Retail quotations of Redwood are as follows:

ROUGH MERCHANTABLE—₱ M ft, $22.50; do Selected, $27.50; do No. 2, $18.50; Surface, No. 1 and Rough Clear, $40; do, 1x6, $37.50; do, No. 2, $30; Rustic, No. 1, 1x8, $37.50; do, No. 1, 1x10, $40; do, No. 2, $35; do, under 10 ft, $35; T and O Redwood, 1x4, 1¼x4 and 1¼x0, $40; do do, 6-inch, 12 ft and over, $37.50; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; do do do, No. 2, $30; do do, Beaded, 12 ft and over, $40; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; Half-inch Surface, $32.50; Pickets, Fancy, $30; do, Rough, pointed, $20; do do, square, $17.50; Siding, ½-inch, $27.50; Battens, ½-inch, per lineal ft, 1c; Shingles, ₱ M, $2.50; Shakes, Split, $15; do, Sawed, $12; Posts, per piece, 13c; Dressed Boards, ₱ M ft, $25.

On a credit of 60 days or less, or a discount of two (2) per cent for cash only. On all credits exceeding 60 days' time, not less than one(1)per cent per month to be added.

Under the rules of the Exchange, no "lump" sum will be given on any bill of lumber.

Nails.

We give the price list of the Pacific Iron and Nail Company.

FENCE AND BRAD.—10d to 60d, $2.75: 8d and 9d, $3.00; 6d and 7d, $3.25 4d and 6d, $3.50; 3d, $4.25; 2d, $5.50.

BARRELS.—⅜ inch, $6.75; ½ inch, $5.75; 1 inch, $5.25; 1½ inch, $4.50; 1¾ inch, $4.25; 1⅞ inch, $3.76; 1¼ inch, $3.50.

LINING.—½ inch, $7.26; ⅜ inch, $8.75.

TOBACCO.—10d, $3.25 8d, $3.50; 6d to 7d, $3.75.

CLINCH.—6d to 30d, $4.50.

SLATING.—6d, $3.75; 4d, $3.75; 3d, $4.50; 2d, $5.75.

FINISHING.—2d, 1 inch, $8.75; 3d, 1¼ inch, $6.75; 4d, 1½ to 1⅞ inch, $4.50; 6d, 2 inch, $4.25; 8d, 2½ inch, $4.00; 10d, inch and over, $3.75.

CASING AND BOX.—10d to 30d, $3.50; 8d, $3.75; 0d, $8.00; 4d, $4.25; 3d, $5.25.

FINE BLUED.—4d, $4.50; 3d, $5.75; 2d, $6.50.

CUT SPIKES.—All sizes, $3.00.

BOAT SPIKES.—All sizes, $3.50.

Each half keg 10 cents extra.

TERMS.—Note or acceptance at 60 days with current rate of Exchange on S. F., or a discount of 2 per cent for cash, if remitted within 10 days from date of invoice.

All accounts when due subject to sight draft without notice.

An abatemeot of 10 cents per keg will be allowed upon orders of 200 kegs or over.

Building Material.

Lime, per barrel, $1.50@$1.00. Plaster, $2.75–3.00. Eastern Plaster, $3.00–3.26. Rosendale Cement, $2.25–2.75. Portland Cement, $3.50–3.75. Fire Brick, per 1,000, $40 @ $45, according to brand; hard, $10.00@$12,00; red, $8.00@$8.50; soft, $7.50; face, $30.00.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
J. J. BARTELL—Sacramento and San Joaquin Counties.
A. C. KNOX—San Benito and Monterey Counties.
GEO. MCDOWELL—Santa Clara County.
WM. H. COOK—Fresno County.
G. W. INGALLS—Arizona.
W. WHITEWELL—Oregon.
M. S. PRIME—Alameda County.
MRS. OZIER—Humboldt County.
E. G. NORTHUP, Sacramento County.

THE newly discovered tin mines of Rockbridge county, Va., extend over an area eight miles in length by one in width, and some of the ore taken out has yielded from 50 to 60 per cent of metal.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCA	N. NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M and M Co	Alaska	3	50	Dec 10	Jan 11	Jan 31	T J Hay	306 Pine st
Alpha Con M Co	Nevada	19	50	Jan 20	Feb 25	Mar 21	W Willis	309 Montgomery st
Acme M and M Co	California	8	12	Jan 14	Feb 20	Mar 13	J M Buffington	309 California st
Alta S M Co	Nevada	31	25	Dec 24	Jan 9	Jan 28	W H Whatson	302 Mootgomery st
Arnold M Co	Arizona	3	1 00	Jan 3	Feb 7	Mar 2	A Judson	320 Sansome st
Black Bear M Co	California	2	25	Dec 20	Jan 25	Feb 20	W L Oliver	328 Montgomery st
Bulwer Con M Co	California	1	20	Jan 13	Feb 24	Mar 21	W Willis	309 Montgomery st
Con Virginia and California	Nevada	22	20	Jan 15	Feb 20	Mar 21	A W Havens	309 Montgomery st
Copper Mt Con M Co	California	1	05	Dec 3	Jan 13	Feb 10	A L Perkins	310 Pine st
Eintracht Gravel M Co	California	17	05	Dec 9	Feb 7	Feb 16	H Kuntz	209 Sansome st
Exchequer M Co	Nevada	21	20	Jan 2	Feb 5	Feb 26	C C Elliott	309 Montgomery st
Grand Prize M Co	Nevada	17	36	Nov 24	Dec 30	Jan 28	E M Hall	327 Pine st
Happy Valley Gravel M Co	California	5	03	Dec 15	Jan 21	Feb 9	D M Kent	330 Pine st
Hale & Norcross S M Co	Nevada	83	50	Dec 8	Jan 13	Feb 3	J F Lightner	309 Montgomery st
Independence M Co	Nevada	14	13	Jan 21	Mar 2	Mar 30	J W Pew	310 Pine st
Martin White M Co	Nevada	19	25	Jan 15	Feb 25	Mar 25	J J Scoville	309 Montgomery st
Mammoth Bar M Co	California	7	10	Jan 19	Feb 20	Mar 13	J W Pew	310 Pine st
Mayflower Gravel M Co	California	28	10	Jan 20	Feb 27	Mar 20	J Morizio	328 Montgomery st
North Gould & Curry M Co	Nevada	8	05	Jan 12	Feb 13	Mar 2	C H Mason	331 Montgomery st
Peer M Co	Arizona	2	50	Jan 14	Feb 19	Mar 16	A Waterman	309 Montgomery st
Peerless M Co	Arizona	3	50	Jan 14	Feb 18	Mar 14	A Waterman	309 Montgomery st
Summer Con M Co	California	2	05	Dec 18	Jan 19	Feb 12	F E Luty	330 Pine st
Silver Lining M Co	Nevada	1	07	Dec 16	Jan 24	Feb 19	J. Stadfeld	419 California st
Silver Hill M Co	Nevada	21	15	Jan 9	Feb 13	Mar 5	W E Dean	309 Montgomery st
Utah S M Co	Nevada	52	50	Dec 19	Jan 26	Feb 14	G C Pratt	309 Montgomery st
Virginia Creek Gravel Co	California	1	20	Dec 20	Jan 25	Mar 2	J M Quay	406 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Con Amador M Co	California	F B Latham	408 California st	Annual	Feb 2
Holmes M Co	California	C T Bridge	224 California st	Anonal	Feb 10
Sulphur Bank Q M Co	California	L Hermano	220 Sansome st	Annual	Feb 2
Trinity M Co	California	J M Selfridge	401 California st	Annual	Feb 4

LATES'T DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D O Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	B L Burling	328 Montgomery st	50	Dec 5
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Dec 15
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Oct 8
Jackson M Co	California	D C Bates	309 Montgomery st	10	Dec 27
Navajo M Co	Nevada	J W Pew	310 Pioe st	25	Jan 13
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Nov 28
Silver Kiog M Co	Arizona	J Nash	328 Montgomery st	25	Jan 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Nov 6

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication to this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE. Jan15-Jan 21	Portland. Rain.	Temp.	Wind.	Weather.	Red Bluff. Rain.	Temp.	Wind.	Weather.	Sacramento. Rain.	Temp.	Wind.	Weather.	S. Francieco. Rain.	Temp.	Wind.	Weather.	Los Angeles. Rain.	Temp.	Wind.	Weather.	San Diego. Rain.	Temp.	Wind.	Weather.
Thursday	.00	34	E	Cy.	.00	50	NE	Fr.	.00	45	S	Cl.	.00	50	NE	Fr.	.00	59	SE	Fr.	.00	61	W	Cl.
Friday	.00	30	E	Cy.	.00	48	E	Fr.	.00	52	S	Cy.	.00	52	NE	Cy.	.00	61	E	Fr.	.00	62	W	Cl.
Saturday	.12	34	—	Cy.	.01	50	N	Fr.	.01	49	NW	Cl.	.	52	N	Fr.	.00	61	SE	Cl.	.00	60	W	Fr.
Sunday	.10	34	W	Fy.	.00	56	N	Cl.	.00	48	NW	Cl.	.00	47	NE	Cl.	00	66	N	Cl.	.00	63	W	Cl.
Monday	.05	37	E	Cy.	.00	63	N	Cl.	.00	48	SE	Cl.	.00	55	NE	Cl.	.00	69	SE	Cl.	.00	65	SW	Cl.
Tuesday	.00	32	E	Cy.	.00	44	S	Fr.	.00	47	SE	Cy.	.00	56	E	Cl.	.00	67	SW	Cl.	.00	68	W	Cl.
Wednesday	.01	30	—	Cy.	.00	51	N	Cl.	.00	43	N	Cl.	.00	52	N	Cl.	.00	62	E	Cl.	.00	64	NW	Cl.
Totals	.28				.01				.01				.—				.00				.00			

EXPLANATION.—Cl, for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too sma l to measure. Temperature wiod and weather at 11:58 A. M. (San Francisco mean time), with amount of rainfall in the precediog 24 hours

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Dec. 31.		WEEK ENDING Jan. 8.		WEEK ENDING Jan. 15.		WEEK ENDING Jan. 22.	
Alpha	....	.65	.70	.80	.45	.50	.25	.30
Alta	.10	.15	.05	.30	....	.30	.25	.30
Andes	.15	.20	.10	.15	....	.10	....	.10
Argenta	....	....	....	.05	....	....	....	....
Belcher	....	.60	.65	.70	.65	.85	.70	.75
Belding	....	....	....	....	....	....	....	....
Best & Belcher	1.30	1.45	1.10	1.35	1.10	1.25	.55	1.25
Bullion	....	.25	.20	.25	....	.25	.15	.20
Bonanza King	....	....	....	....	....	....	....	....
Bebe Isle	....	.20	....	.15	....	....	....	....
Bodie Con	1.90	2.10	1.95	2.10	1.95	2.10	1.90	2.05
Benton	....	.10	.05	.65	....	.05	.90	.05
Bodie Tunoel	....	....	....	....	....	....	....	....
Bulwer	.20	.50	.25	.35	....	.25	....	.10
California	.35	.40	.25	.35	....	.30	.10	.30
Challenge	....	....	....	.25	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Chollar	2.40	2.70	1.70	2.15	1.75	1.95	1.25	1.95
Confidence	....	.75	.85	.90	.75	.90	.75	.90
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.35	.40	.25	.35	....	.30	.10	.30
Con. Pacific	....	1.10	....	1.10	1.00	1.15	.90	1.85
Crown Point	....	....	.75	.95	.80	.90	.80	.90
Day	....	....	....	....	....	....	....	....
Eureka Con	1.25	1.80	....	1.15	1.15	2.00	2.10	2.40
Eureka Tunoel	....	....	....	....	....	....	....	....
Exchequer	....	.15	.05	.15	....	.05	....	.05
Grand Prize	....	....	....	....	....	....	....	....
Gould & Curry	1.10	1.30	.95	1.15	1.00	1.20	.50	1.15
Goodshaw	....	....	....	....	....	....	....	.05
Hale & Norcross	3.65	4.10	3.40	3.75	3.60	5.00	2.40	5.13
Holmes	4.50	5.00	4.55	4.80	....	4.75	4.50	4.75
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	.15	.20	....	....	....	.15	....	.10
Martin White	.35	.40	....	.35	....	....	....	....
Mono	1.30	1.55	1.25	1.30	1.25	1.55	1.05	1.45
Mexican	.85	.75	.50	.65	.40	.55	.25	.50
Mt. Diablo	3.70	3.75	....	....	3.50	3.60	....	3.75
Northern Belle	....	....	....	....	....	....	....	....
Navajo	1.90	2.05	1.85	2.05	1.75	2.00	1.55	1.80
North Belle Isle	....	.25	.15	.20	....	.15	.10	.20
Occidental	....	.75	.75	.85	.90	1.00	.75	.90
Ophir	.85	.70	.60	.65	.40	.55	.25	.50
Overman	....	....	....	.10	.05	.10	....	....
Potosi	.80	1.00	.65	.60	.70	.90	.50	.80
Final Con	....	....	....	....	....	....	....	....
Savage	1.60	1.80	1.60	1.80	1.60	2.00	.90	2.00
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	.70	.80	.60	.75	.50	.65	.35	.70
Silver Hill	....	....	....	....	....	....	....	....
Silver King	....	....	....	....	4.60	5.00	....	4.60
Scorpion	....	.10	.05	.15	....	.10	....	.10
Syndicate	....	....	....	.30	....	.40	....	....
Tioga	....	....	....	....	....	....	....	....
Union Con	.55	.70	.50	.60	.50	.65	.35	.60
Utah	.15	.40	.15	.20	.15	.50	.15	.55
Yellow Jacket	1.00	1.15	1.20	1.60	1.20	1.25	....	....
	....	....	....	....	....	....	....	....

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let bim not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some responsible party requested to stop it, we shall positively demand payment for the time it is sent.

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Jan. 22.

75 Bodie Con 1.95
50 B. & Belcher ..... .85@90c
200 Bullion 10c
400 Bulwer ..... .05c
200 Belmont 30c
175 Chollar ..... 1.25@1.30
70 Con. Va & Cal 10c
50 Crown Point 80c
800 Gould & Curry ..... .65@70c
300 Hale & Nor 2.90
100 Mexican ..... .40c
300 Mono 1.20
100 Navajo ..... .70
100 Ophir ..... .40c
50 Occidental 80c
240 Potosi ..... .50c
20 Sierra Nevada ..... .45c
380 Savage 1.60
170 Union Con ..... .40c@45c

AFTERNOON SESSION.

300 Bodie 1.00
200 Belcher ..... .85c
525 B. & Belcher ..... .80@85c
50 Belmont 30c
100 Benton Con ..... .05c
100 Chollar 1.45
200 Crown Point ..... .80@85c
34 Con Va & Cal 15c
$40 Gould & Curry ..... .65c@70c
100 Goodshaw ..... .05c
3350 Hale & Nor ..... 2.95@3.95
50 Holmes 4.65
600 Mono ..... 1.10@1.15
200 Mexican ..... .50c
380 Navajo ..... 1.65@1.70
115 Ophir ..... .30@35c
10 Occidental ..... .75c
510 Sierra Nevada 40c
1585 Savage ..... 1.05@1 10
25 Scorpion ..... .15c
50 Silver King 4 00
795 Union ..... .35@40c

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Jan. 22, 1885.

ANTIMONY—Per pound		—	@ —
Hallet's		12½	@ —
Cookson's		13	@ —
BORAX—Refined		7¼	@ 8
IRON—Glengarnock ton		23 00	@ —
Eglinton, ton		22 00	@ —
American Soft, ton		21 00	@ —
Oregon Pig, ton		—	@ —
Clipper Gap, Nos. 1 to 4		25 00	@ 30 00
Clay Lane White		25 00	@ —
Shotts, No. 1		26 00	@ —
Refined Bar		3	@ ¼
Boiler, 1 to 4		5 00	@ 5 50
STEEL—English, lb		16	@ 25
Black Diamond, ordinary sizes		13	@ —
Plow		8	@ 8
Machinery		10	@ 12
COPPER—			
Braziers' sizes		—	@ 25
Fire-box sheets		28	@ —
Bolts		22	@ —
Yellow Metal		14	@ 15
LEAD—Pig		3½	@ 3¾
Bar		5	@ —
Pipe		7	@ —
Sheet		8	@ —
Shot, discount 10% on 500 bag	Drop, ₱ bag.	1 85	@ —
Buck, ₱ bag		2 05	@ —
Chilled, do		2 25	@ —
TINPLATE—Oldcastle		5 25	@ 6 00
Charcoal		5 75	@ 6 75
Coke		5 25	@ 6 50
Roofing		6 25	@13 50
ZINC—German		9	@ 10
Sheet, 7x3 ft, 7 to 10 lb, less the cask		9	@ 10
QUICKSILVER—By the flask		32 50	@33 00
Flasks, new		1 05	@ —
Flasks, old		85	@ —
NEW YORK PRICES—			
California BORAX, refined		8½	@ 9
Pig Iron, American No. 1		18 50	@19 00
Pig Iron, American No. 2		17 00	@17 50
Quicksilver		48	@ 50
Lead		3 50	@ 3 57½
Copper		—	@ 11¾
Tin		17	@ —
Bar Silver		1 06½	@ —

FLORIDA oranges are selling at one cent apiece at wholesale in Atlanta, the market being glutted with them.

The Mining Share Market.

The market has been in a declining mood this week, prices having fallen. The proposed stoppage of work below the Sutro tunnel level in the series of Comstock mines, north of the Savage, has affected the market. Still, many persons holding shares in Comstock mines are hopeful that in the old upper levels more good ore will be found, and perhaps they will strike a bonanza.

Fifteen stamps of the Standard-Bulwer mill at Bodie have started on ore from the Standard Consolidated mine, and regular shipments of bullion will follow, as a large quantity of ore has been accumulated and the mine is showing well in several places.

Bullion Shipments.

King (San Bernardino county), Jan. 16, $3,905; Alhambra, 16, $13,490; Parker (Idaho), 12, $11,000; Alice (Montana), 6, $18,680; Lexington, 6, $19,152; Old Lexington, 7, $1,584; Moulton, 7. $12,314; Dexter, 10, $18,000; Alice, 9, $22,288; Hanauer, 13, $7,600; Minnie Moore (Idaho). 13, $6.030; Ontario, 13, $17,942; Hanauer, 14, $5,600; Crescent, 15, $8,300; Hanauer, 15, $2,700; Ontario, 16, $20,382; Minnie Moore, 16, $3,012; Hanauer, 16, $2,700; Minnie Moore, 17, $3,820; Hanauer, 17. $2,750; Crescent, 17, $3,250; Minnie Moore, 18, $1,910, The banks of Salt Lake City report the receipt for the week ending January 14th, inclusive, of $79,859.45 in bullion, and $24,140 in ore; a total of $103,999.45.

IN Inyo county the people generally have signed a petition for a reduction of salaries, as provided by the County Government bill, to a figure that the county can pay and live. Under the present law it will take about all the revenue of the county to pay the salaried officials. By some accident Inyo was salaried considerably beyond its means when the law was enacted.

DELINQUENT NOTICE.

Eureka Gas Company.—Location of principal place of business, San Francisco, Cal. Location of works, Eureka, Humboldt county, Cal.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied December 3, 1884, the several amounts set opposite the names of the respective shareholders, as follows:

	No. Certificate.	No. Shares.	Amount.
Burling, James W	23	3	3 00
Burling, James W, Trustee	29	200	200 00
Burling, James W, Trustee	30	200	200 00
Burling, James W, Trustee	31	100	100 00
Burling, James W. Trustee	32	200	200 00
Burling. James W, Trustee	33	200	200 00
Burling, James W, Trustee	34	100	100 00
Condiet, J Elliot	24	2	2 00
Smith, Claude L	2	5	5 00
Smith, Claude L	22	200	200 00

And in accordance with law, so many shares of each parcel of such stock, as may be necessary, will be sold at public auction at the office of Cobb & Co., No. 321 Montgomery St, San Francisco, Cal, on Monday the 2nd day of February, 1885, at the hour of 12 o'clock M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

C. S. BATCHELDER, Secretary.

OFFICE—302 Pine St, San Francisco, Jan. 15, 1885.

ASSESSMENT NOTICE.

Fremont Mining and Milling Company.— Location of principal place of business, San Francisco, Cal. Location of works, Amador county, near Drytown, Cal.

NOTICE is hereby given that at a meeting of the Trustees, held on the twenty ninth day of December, 1884, an assessment (No. 1) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, No. 402 Front street, room 8, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the fourth day of February, 1885, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday the twenty-seventh day of February, 1885, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

MARK T. ASHBY, Sec'y.

OFFICE—No. 402 Front St., Room 8, San Francisco, Cal.

Carr's Electro Amalgamating Process.

Mr. Samuel Bear is now in the city, and will be pleased to confer with parties having Gold Ores who experience difficulty in working them. The Process will treat Free-Milling Ores, and also Sulphuret Ores without roasting, and recover a high percentage at no greater cost than by plate method. All those interested will find it beneficial to examine the process. Liberal inducements offered. Letters addressed to SAMUEL BEAR, Box No. 1, "Mining and Scientific Press" Office, San Francisco, will receive his attention for interview.

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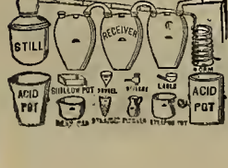

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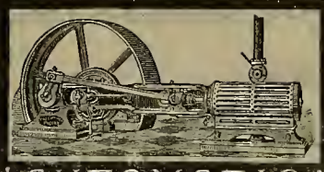
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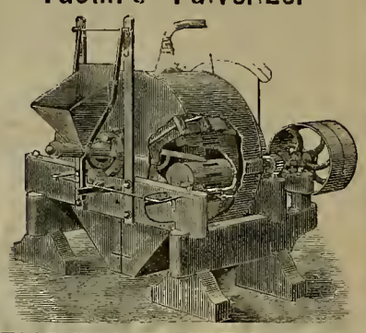
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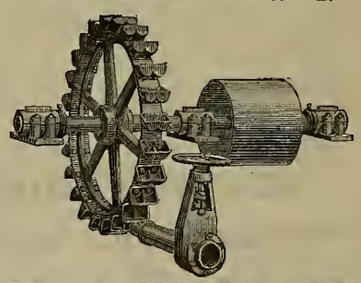
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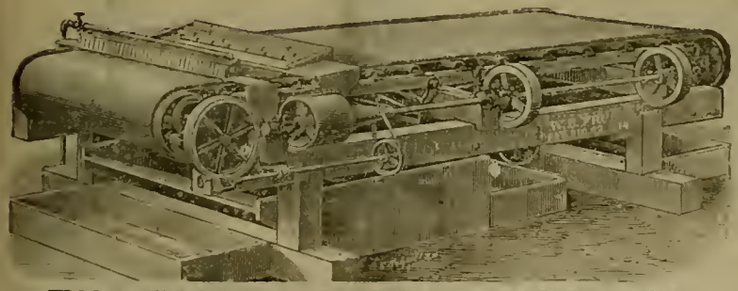

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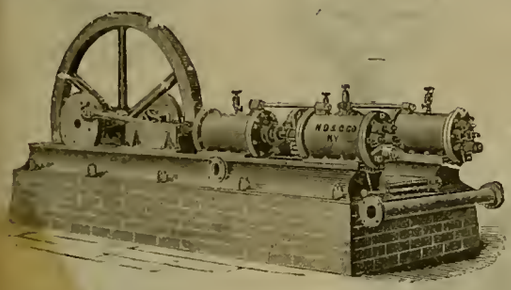

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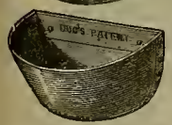

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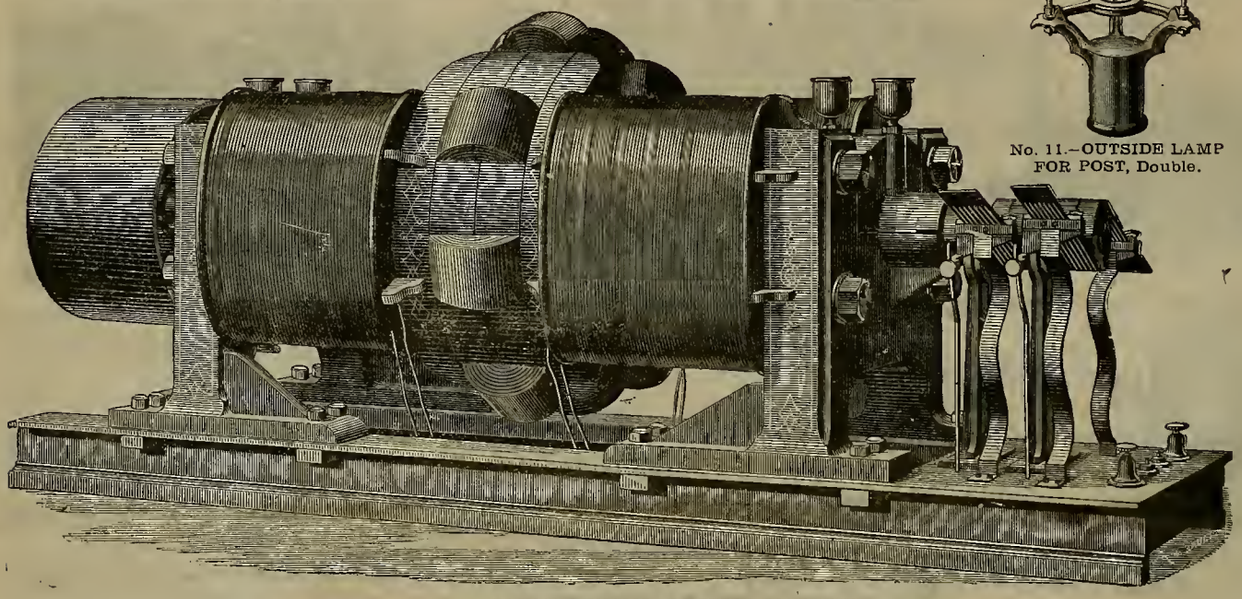

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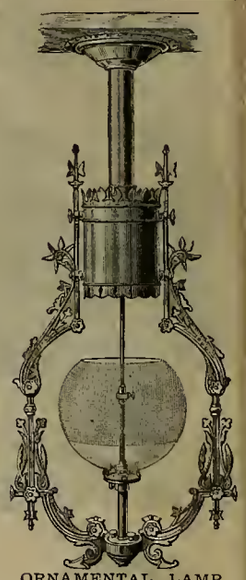

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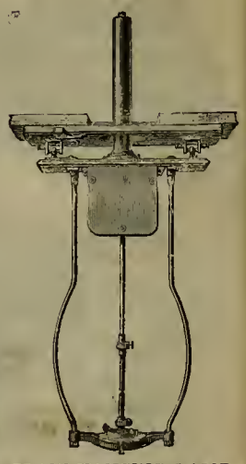

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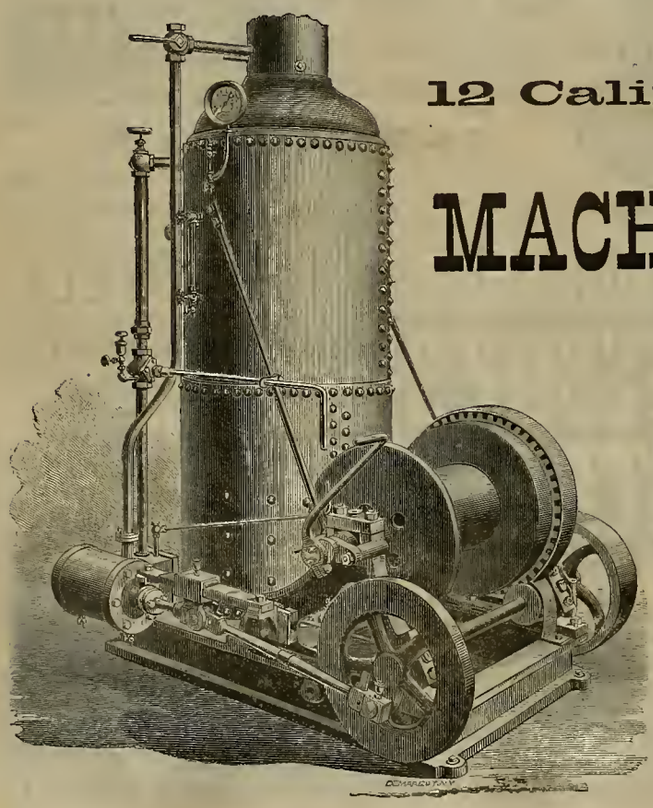

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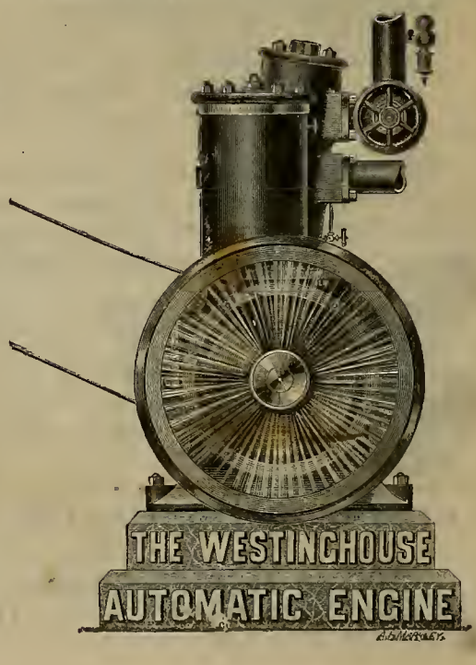


MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, JANUARY 31, 1885. VOLUME XLXX. Number 5.

Street Railway Propulsion.

While we in San Francisco are largely interested in the development of our cable railways, in other cities the same prejudice in their favor does not exist, and other methods are proposed, economy of power being the argument in favor of each method put forward. If the advocates of each system will take the pains to test practically the actual amount of power required for the movement of trains taking a fair average of traffic over each kind, then a more reasonable comparison can be made of the economy of each.

For the system which has grown up in San Francisco, we have some data acquired by Mr. W. W. Hanscom, taken from the actual conditions of each of the cable roads in this city, and we find that the average proportions of power consumed in drawing cable, cars and passengers, are for cables 68 per cent, cars, 28 per cent, and passengers 4 per cent of the total power. As the earlier constructed roads have larger averages for moving cable, and smaller for moving cars and passengers, so the later constructed roads have smaller proportions for moving the cable, so that as experience has improved the construction, we are enabled to be assured of the cable requiring not more than from 50 to 60 per cent of the total power consumed, and these not under the most favorable conditions.

We notice the suggested application of electricity for the movement of trains on the Brooklyn bridge, and also on the elevated railways of New York city, and the Railroad *Gazette* publishes the estimates of Professor Farmer, as to the cost of electricity when applied to this service. He assumes that the dynamos and electric motors, will deliver 81 per cent of the indicated power of the stationary engines in useful work in propelling trains, but this seems to be all estimate, without any actual experience to corroborate the assertion; for it seems that in Prussia, at the Zankerode colliery, a railroad worked by electricity has been in use for over two years, the line, electric motors, etc., being made by the well-known firm of electricians, Messrs. Seimens and Halske, of Berlin. The result on this road is that only 30 per cent of the indicated power of the stationary engine working the dynamo, is developed by the electric motors. Further improvements may develop a greater per cent of useful effect, but we do not yet see that the friends of the cable railway system, need have any present fears of the economy and other advantages of that plan being much exceeded by any other, even if it may be equaled.

An Important Association.—An association has recently been formed in Mexico under the name of the "Universal Mechanical Agency" for the purchase and shipping of machinery and all kinds of manufactured articles to any part of the country. M. Gonzalez Marron is the general agent, and Pablo Bonnemo, Elexandro Quijano, M. Pastor Valdes and Plutarco Rodriguez, agents in this city, Puebla, Vera Cruz and Orizaba, respectively. The agents undertake to furnish skilled machinists to attend to the setting up of machinery when such help may be desired. If this association is really what it pretends and seems to be, it will be well for our manufacturers and others interested in building up a trade with Mexico, to lose no time in early making acquaintance with it. Its assistance will, no doubt, be sought for with alacrity by people of other countries seeking to introduce their goods into Mexico.

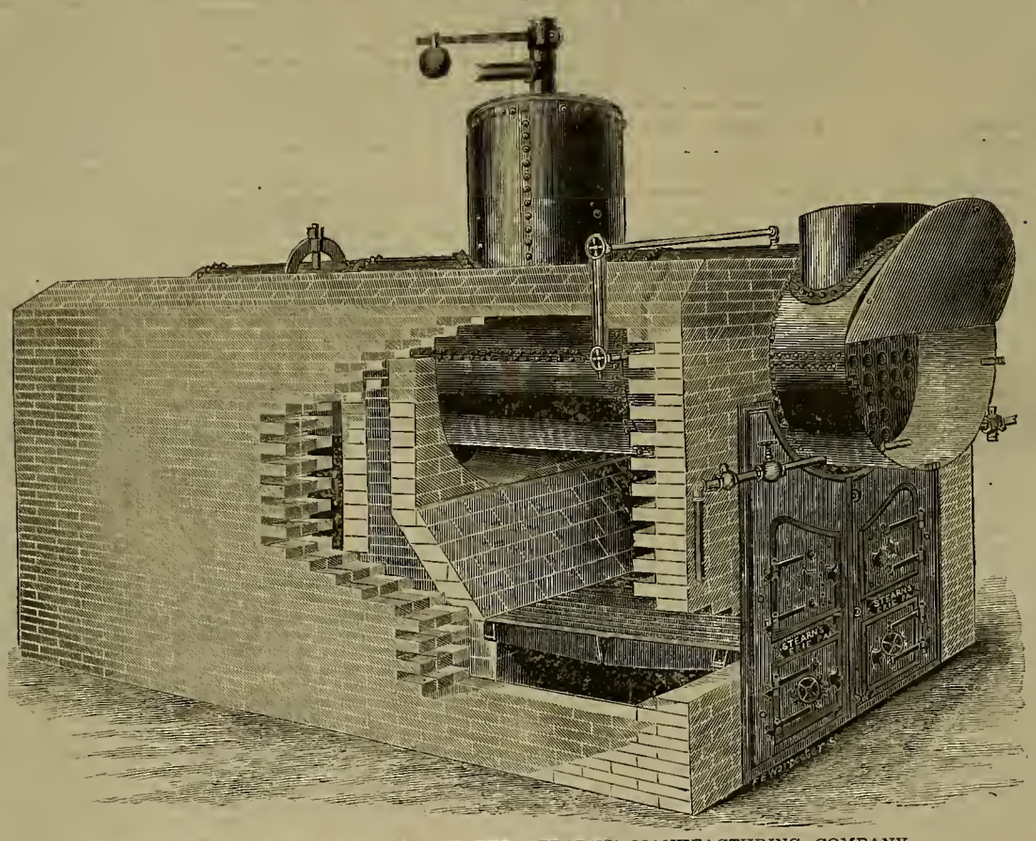
The director of the Geological Survey, in his December reports, says: Dr. C. A. White has made a special study of certain fossils collected in the Valley of the Sacramento, and the result of this investigation added to the information obtained by Assistant Geologist Diller, who made the collection, clearly shows the Tejon group is not the only coal-bearing formation in California, and further indicates that this coal of the upper Sacramento is of the same age as that of Vancouver Island.

The deepest gold mine in the world is the Eureka, in California, which is down 2,200 feet or 500 feet below the level of the sea.

The Stearns Stationary Boilers.

The engraving on this page represents one of the stationary tubular boilers such as are made by the Stearns Manufacturing Company. They are economical in the use of fuel and readily set. They are furnished made of steel of 60,000 pounds tensile strength, flange iron of 55,000 pounds, with fire top sheets over fire if desired, or of C. H. iron of 45,000 to 50,000 pounds tensile strength. The boilers are all tested and inspected before shipment by a responsible steam boiler inspection and insurance company. Some 18 sizes of tubular boilers are made by the company, and orders can be filled in a short time. The greatest care is taken in making these boilers that they shall be strong and safe, that is they endeavor to combine such materials, workmanship and proportions as will produce work in which confidence can be placed, and in which as far as human foresight can provide, absolute safety is secured. To this end they procure iron and rivets of the best brands known to the trade, insisting upon a careful inspection at the rolling mill, and making another inspection during manufacture. All imperfect sheets are rejected.

Good material and workmanship must go hand in hand, or the boiler is unsafe and worthless. In all cases the rivets must be so spaced that the metal left between the rivet holes is as nearly as possible of the same strength as the rivets, and such riveting must be used as will fill the holes full of metal, making each rivet bear its share of the strain. Unless this is carefully carried out a boiler is no stronger built of 70,000 pound tensile strength metal than of 45,000-pound tensile strength metal, because if the rivets are the weak place they will not be stronger in steel than in iron. Realizing this fact, they use the best rivets, driven by heavy pressure, filling the holes full from head to head, spacing them according to thickness and strength of sheets. Making staudard sizes they are enabled to provide expensive jigs and templets that lay off the holes perfectly, so that all holes come fair, and nothing is slighted.



STATIONARY TUBULAR BOILER OF THE STEARNS' MANUFACTURING COMPANY.

In this connection, the manufacturers say: "The objections urged against machine riveting are puerile in the extreme, and serve only to display the ignorance of parties asserting the old, old story of the superiority of the old over the new. They forget or ignore the fact of crystallization, which is the inevitable accompaniment of hand riveting, and the cutting of the sheet by the hammer face, thus adding to the weakness caused by punching, while the rivet, which under the blow of the machine piston is thoroughly upset while hot dan ductile, and fills the hole completely at a single blow, when driven by hand, rapidly chilling, is rarely made a perfect job. Experiments made with cross-sections cut through seams and rivets, formed by both processes, have demonstrated the marked superiority of machine work over hand riveting, in some instances showing nearly 25 per cent greater T. S. in the former than in the latter."

All boilers of this make of 36 inches and over are double-rivsted on the side seams. The thicknesses of the sheets are so proportioned that their strength is six times greater than the ordinary working pressure of 80 to 100 pounds per square inch. This allowance of strength is according to rules established by the United States inspection laws. A double-riveted boiler is allowed to carry 20 per cent more pressure than a single-riveted boiler.

The Pacific branch of the Stearns Manufacturing Co. in this city will shortly occupy a new fire-proof, two-story building, Nos. 29 to 31 Spear street, which they are now erecting. They will occupy the entire building.

The Worcester *Spy* reports that several foundries in that city have tried the cheap Southern iron which is now being pushed in the northern markets, and found it so deficient in strength that they will not use it.

Swept Out to Sea.—During the recent storm the Clatsop Mills Company's wharf at Astoria, and lumber and laths valued at $4,000 were swept out to sea. Only a small portion was recovered.

CORRESPONDENCE.

We admit, unendorsed opinions of correspondents.—EDS.

The Mineral Belt of Amador County.—No. 4.

EDITORS PRESS:—In my letter of last week I promised to continue the description of the mines on this mineral belt. The next north to the Marlett quartz mines, of which I spoke in my previous letters, is the St. Julian. This is 600 by 1,300 feet, and joins the rich Nevills or Mammoth mine, of Jones, Nevil's and others. The late Judge Moore, of Jackson, was the principal owner of this mine; in fact, it belonged to what is called here the "Court-house ring," being the judge's clerk and deputy clerk of the court. Some 10 months ago rich rock of the same character was found here, the same as that found in the Mammoth mine, north of it. A tunnel of 250 feet is run into this mine, west of the ledge, from which nearly $15,000 has been taken out in the past 8 or 10 months. I was at the mine recently, and found John Price, ex-Deputy Clerk, and one of the owners at work. They are about sinking on ore from the bottom of the shaft, some 100 feet from the north of the tunnel, where doubtless they will find a continuation of the rich black gold metal found some months ago, when they were at this point in the tunnel. The clerk of the Superior Court, Thomas Conlin, his deputy, John Price, and A. Caminetti, of Jackson, with the late George Moore, are the joint owners. This mine is supposed to be second only to the Mammoth in riches of black gold-bearing ore. A small stamp mill is on this St. Julian, but no less than $100,000 worth of machinery is required to work successfully, this or any other gold quartz mine.

The next quartz mine, and which joins this, and also the rich Mammoth mine, is the Neville, or

Mammoth Mine No. 2.

Here on the surface, is the identical quartz and other appearances of the Mammoth; but as yet, this mine is undeveloped, and is owed by Dr. Chambers, who resides here upon his Belle Monte ranch adjoining this mine, his cottage being only a short distance from his mine. Five minutes or less time, will take you from Belle Monte cottage (the doctor's residence and home) to the Mammoth No. 2 mine. Here is a chance for parties with a few thousand dollars, to get in on the "ground floor" with the doctor in this mine, by sinking two or three shafts one or two hundred feet deep, and running cross cuts and levels every 50 feet from these shafts, to ascertain the width and extent of this mine. The doctor's post-office address, is Jackson, California. No better opening upon this whole belt or Mother Lode, is to be had than the opening up of this Mammoth No. 2. The parties who may be so fortunate as to get in with him in this mine, will doubtless find themselves bonanza kings in the near future. The very rich Mammoth mine of Senator John P. Jones, Nevills and others, of course, need no further mention than has been given them in the former articles I have written you, as it stands second to no quartz mine, perhaps, in America or the world.

The Valparaiso and Wetzler's Mine.

The next quartz mine north is the Valparaiso mine. This joins the Mammoth mine and has a tunnel of 100 feet run upon it; also 500 or more feet of an open cut down the hill to near its northern boundary in Murphy's gulch. This open cut exposes the ledge nearly the whole 500 feet, and rich gold has been taken out of this lead, which is the first lead patented in this section of the county. This is 600 by 1,500 feet, and is owned by E. Ginochio, *et al* here. Mr. Ginochio is, perhaps, the heaviest of all our merchants in Jackson, Amador county, California, and an old resident, if not a "49er." This Valparaiso mine is only second to the Mammoth in richness, and as it joins it on the north will doubtless form a Bonanza King mine when it is, like the rest, worked with $100,000 worth of machinery. Mr. Ginochio owns 3 or 4 other rich, gold, quartz mines here but works none of them. He owns the Jackson mine in the town or village of Jackson, which has a fine engine and hoisting works upon it, with good large buildings over it. He will sell any or all of his mines, as he never intends to work any of them, he being strictly a heavy wholesale and retail merchant, and wishes to be nothing else.

Adjoining the Valparaiso is the quartz mine John Wetzler. This is an old mine from which Mr. Wetzler has taken out many thousands from the gulches by sluicing and by open cuts. There are two or three tunnels of 100 to 200 feet on this property which have lain idle and filled up at the mouths for years. As Mr. Wetzler owned and sold the St. Julian mine before referred to one year ago to the late George Moore, he has not cared about working or prospecting this mine, and takes the world easy and as it comes, until a week or two ago, when he got tired of doing nothing, and had just got the last payment from the "Court house ring," already referred to in this article, who owned the St. Julian mine; when with another man he went to work in one of these old and abandoned tunnels, and in a week or less time they struck a vein of as fine quartz as ever was crushed in any mill. I was to-day in this tunnel and Mr Wetzler showed me through it; it is only second to the rich Mammoth, which it joins or comes on to. They have to-day and for two days past been pounding out the gold with two hand mortars, he having tin cans full of rich native gold. The lead of quartz is twelve to fourteen inches wide, and is upon the hanging wall. The vein is thirty feet wide to the front wall and gauged seams with slate between and one hundred and fifty feet from grass-roots. The next mine north is the

Kelly Mine.

This has a 20 stamp mill, and a good one, and about 1,500 feet of tunnels, good large blacksmith shop, office, stable, a large boarding house and another large sleeping house upon it. This mine has been idle for the past two years, owing to litigation, which is now about at an end, when this property will start up. The next mine of importance is one-half a mile north of this mine, and is called the Amador Queen mine. This is in Hunt's gulch, and also in Murphy's gulch and ridge. Some 2,000 or more feet of tunnels and 1,000 feet of levels and cross-cuts are in this property. About 3,000 tons of low-grade ore lays upon dumps at different places on this mine, and a small roller mill is being put up to crush the ore. Most of it has lain on the dumps for years past. Mr. S. D. Shugart has just returned from "Frisco," and purchased a mill which got to the mine yesterday, while I was there. Mr. Shugart and James Morgan are the owners of this rich mine and property, with a 20-stamp mill and a number of houses upon it. Mr. Shugart is a Pennsylvania man, and has been in Sonora, Mexico, for years, where he also owns a rich silver mine which he is now working there. Some $75,000 has been taken out at the Amador Queen mine, and from the 400-foot level, and the cross-cuts and levels above this, they have some hundreds of tons of rich milling quartz laying ou the dump, and are taking out every day tons of this rich ore. An air compressor and two Burleigh drills are used in this mine.

I will finish my description of this mineral belt in next week's PRESS. WELLINGTON.

A Proposition for Assayers.

[Written for MINING AND SCIENTIFIC PRESS by C. H. AARON.]

The system which I propose is new from one point of view, and not so from another. It regards the weighing of substances to be assayed. In those cases in which the substance sought is actually obtained it has always been usual to take either 100 parts, a simple multiple of that, or an aliquot part of the same. The weight of substance got is then either its percentage at once, or it must be multiplied or divided by a simple number for the percentage, for, if the substance assayed consisted wholly of that sought, the weight got would be equal to the weight taken. On the other hand, in that class of assays in which the quantity of the substance sought is indicated by that of a different substance got, as, for instance, in the wet lead assay, and in all stoichiometric work, the weight taken is usually 10 or 100 parts, or a simple multiple, and of that but the weight got has to be multiplied by some often inconvenient number in order to find out how much of the substance sought it indicates.

What I propose is, to take in all cases, such a weight of the assay substance as would give 100 parts (or a simple multiple or aliquot part of that), of the substance to be got if the assay substance consisted wholly of the substance sought. The resulting weight would then always be the percentage, or would require only to be doubled, halved, etc., for the percentage. An example of this method occurs in "Leaching Gold and Silver Ores," in the assay of manganese binoxide: the workman is directed to take 99 grains of the assay substance, because that quantity of pure binoxide would cause the evolution of 100 grains of carbon dioxide so that the weight of that actually evolved in the assay is equal to the percentage of binoxide in the sample. Is this not more convenient, as well as more rational, than to take 100 grains for the assay and then have to go through a calculation in order to arrive at the result required? It would be easy for the writers of books on assaying to inform the student as to how much of a substance to take for an assay on this principle.

In the wet assay of lead, for instance, the lead is got as sulphate, which contains 68.329 per cent of lead. If 68.3 or 68.33 parts of the sample were taken for the assay the weight of the sulphate got, in similar terms, would be the percentage of lead in the assay. In the iron assay, if the sesquioxide is to be got and weighed, take 70 parts of the ore and the weight got will be the percentage of iron in the assay. When zinc is to be got as ammonia phosphate, take 36.5 parts. For sulphur, to be got as barium sulphate, take 13.8 parts. For nickel as oxide, 78.7 parts; copper as oxide, 79; copper as xanthate, 33 &c.

Whatever saves time and trouble, practically lengthens life for usefulness or pleasure.

THE IDAHO *Democrat* predicts that the Seven Devils country about 150 miles or so north of Boise, will be the mining attraction of next season. There is a district there, many miles in extent, in which rich silver and copper ores have been found.

The Mining Stock Business in San Francisco.

At the recent annual meeting of the San Francisco Stock and Exchange Board, the retiring president, Geo. T. Marye, Jr., who was at Virginia City, Nev., sent a letter which was read to the Board. In the course of this letter he made the following pertinent remarks:

"Writing from this place I cannot but experience the feeling that the palmy days of the Comstock are over: But while recognizing and regretting this, I still do not feel discouraged. There will always be a Stock Exchange in San Francisco, as in all the other great commercial centers of this country and of moderu Europe. The only question with us is as to the amount of business our Exchange will have. Of course the vast bulk of our business in the past has come from the mines of the Comstock. To them we owe the colossal movement of the Crown Point and Belcher era, and the unparalleled activity of the great Bonanza period. But we have also had during that time periods of excellent business from other sources. You all remember the Meadow Valley, the White Pine, the Raymond & Ely, the Eureka and the Bodie excitements. Similar discoveries will occur again, and, let us hope, with increasing frequency. We may be on the eve of such a development, or even of a greater, now in the Quijotoa district. Nor must it be supposed that we are to be deprived of the Comstock altogether. The bullion product of the Comstock is still large. During 1884, which was a year of great depression, it amounted to nearly $2,500,000. And this yield will probably be much increased by further reductions in the cost of working the ore, which will make it profitable to take out large quantities of low-grade ore, which has until now been neglected; and this, we may reasonably expect, will greatly add to the value of the stock in the mines. Recent developments, too, in what is known as the Six-mile Canyon, seem to justify the hope that new and paying mines may yet be discovered in Virginia. In the deep mines the indications are as good on the 3,000-foot level as they were at or near the surface, and we all know what a strike in any of them would mean. San Francisco is, and will remain, the center of the mining industry in this country, and it is likely that trading in mining stocks will constitute the major portion of our business. But we should continue to give ever-increasing attention and encouragement to dealings in local and miscellaneous securities, and I can see no good reason why the stocks listed in the New York market should not be dealt in here in our Exchange. They are, in other cities of the Union, and even in London. Doubtless it would be a work of some time to build up a business in them, because we should have not only to provide the means of transacting it, but to attract the attention of the public to it afterwards. But the work is perfectly feasible, and I would recommend that the Board take action in the matter, and to that end they open a correspondence with our fellow member, Mr. C. A. Kinney, who is now in New York, and who has always been in favor of this step.

Copper City, Shasta County.

Our people are feeling very good, says the Republican *Free Press*, over the veritable boom in store for Copper city, which is tributary to and will materially effect the business interests of Redding. Spruance & Stanley, of San Francisco, after 10 years of litigation and an expenditure of $20,000, have established their title to the Winthrop mine, and have recently leased the same to Dickson, DeWolf & Co. and Charles Cusheon Jones, of San Francisco, for 10 years, with the express provision, so we are informed, that the company will work the mine continuously during that time. As a result of the transaction Mr. Jones arrived several days ago, full handed and prepared to actively commence operations. He was accompanied by a gentleman named Catton, who will act as cashier of the company, and by Mr. Stewart, formerly of the Afterthought mine at Furnaceville, who will have charge of the mill, and who, by his experience in metals, is thoroughly qualified for the position. Mr. Stewart is familiar with all the processes known, by which base metals are worked, including the process used at Swansea. He was the only man who ever succeeded in working the base metals of the Afterthought satisfactorily, and had he been backed up by the stockholders of the mine as he should have been, it would he running successfully to-day. The ore of the Winthrop mine has been thoroughly tested in a dozen different ways and by various processes, and Mr. Stewart and the managers are so confident of success that they are willing, and in fact are preparing, to invest heavily. As a guarantee that there is no child's play about their undertaking, Mr. Jones has purchased the old mill, assay building and other buildings, which, when the Extra company hursted up, fell into the hands of Mr. A. Potter. The machinery of the old mill will be taken out, at least such portions as are not needed, and will be replaced by new machinery adapted to the process which they propose to make use of. In addition to this Mr. Jones has now at the depot shovels, picks, drills and other tools necessary to open up the mine, sink shafts, run tunnels and extract ore, and as soon as the roads get in proper condition these necessary tools, together with other supplies, will be transported to Copper city. In fact, a few articles have already been sent thither. No miners will be employed for at least 90 days, when a force will be put on and Copper city will be a scene of great activity. Mr. Catton informs us that there is at present about 1,400 tons of good ore on the dump, sufficient for all present purposes. One thing is certain, there is an abundance of coin to back up the enterprise, and the earnestness displayed in preparation is a good augury of success. Although Copper city has had many ups and downs, those who are best acquainted with its mineral wealth have never, for a moment, doubted its ultimate triumph, and all that is necessary to insure its permanent prosperity is capital, skill and an honest purpose on the part of the superintendent and managers, with no gouging of stockholders. With honest, legitimate mining Copper city will become one of the best mining camps in the State.

The Silver Question.

The Governor of the State of Nevada, in his message referring to request to appoint delegates to the Silver Convention of Denver, says: The gentlemen composing this committee represent the leading producers of silver in nineteen counties of Colorado. I deem the subject of sufficient importance to justify me in calling your attention to it, and to invite you to take such action as you may consider best to have the State of Nevada properly represented in said convention.

The silver producers of our State feel justly alarmed at the unexpected hostility lately manifested toward our leading industry, and are solicitous that prompt action should be taken to prevent, if possible, further degradation of silver as money, and prevent the repeal of the law authorizing the coinage of not less than $2,000,000 per month.

In his late annual message to Congress, President Arthur recommends that the coinage of silver be stopped. The Secretary of the Treasury makes a like recommendation in his annual report. Bills have been introduced in both Houses of Congress to carry out their recommendations.

I ask that no time be lost in memorializing Congress against the adoption of this unfriendly legislation.

Had it not been for the injustice done us by the Federal Government, we would have the same right of coinage for our silver that we have for our gold.

Having deprived us of a portion of our right of coinage, the Government now proposes to degrade silver to an equality with the base metals by denying it all value as money. The mere recommendations contained in the President's message reduced the market price of silver over three cents per ounce. Should Congress unfortunately pass a law in response to that recommendation, its effect would be most disastrous to the leading interests of our State, and would probably result in shutting down many mines, not only here, but also in Colorado, Utah, Arizona, New Mexico, Idaho and Montana.

The terrible blow would not be felt by the miners and mine owners only, but the thousands of farmers, laborers and transport companies, who are employed in furnishing supplies of various kinds to those engaged in mining, would be shut off from a market, and widespread ruin would supplant fair prosperity in two States and five Territories.

I know I can rely on your patriotism and sense of justice to do whatever is in your power to prevent the accomplishment of the wrong that now threatens our greatest industry.

There is no doubt about our having the co-operation of all the silver-producing States and Territories in our efforts to secure the welfare and protection of our constituents.

The Convention at Denver is the first step toward bringing together the representatives of our threatened interests, and may result in such an expression of popular sentiment in the States and Territories engaged in silver mining as not only to defeat the unjust and pernicious legislation recommended by the President, but may result finally in restoring to us our equal right of coinage of both gold and silver. Should Congress not indulge in any further unfriendly legislation, and, in fact, reject that which is now pending, we would have reason to hope that the present efforts to develop mines would be encouraged and greatly increased, and would reasonably anticipate the revival, at an early day, of our mining industries, and, as a consequence, the restoration of general prosperity, which we know is dependent in this State on successful mining.

THEORETICAL GOLD MINING.—A few years ago some theorists spent several thousand dollars in attempting to pump the golden sands from the bottom of Snake river by a vacuum process in order to wash out the gold. They had a large boat on which was an immense steam boiler and a steam cylinder in which a vacuum was produced by the injection of cold water by which the sands were sucked up to be washed. The great cylinder and some other parts of the machinery are lying along the shore—the only monument of their folly. Others are now constructing ditches to take the water from the river above the rapids, and propose to work the placers of a bar below by a more practical process and it is hoped that they will be more successful.

MECHANICAL PROGRESS.

Progress in Steel Manufacture.

Steel manufacturers, says a correspondent of *The Age of Steel*, as a class are proud to the closest adherence to the processes of the forefathers, and new beginners generally are the ones who largely introduce new processes. In the conversion of iron into steel for various purposes different processes are a necessity, for those days when knives, scissors, razors, pins and the like were all cut from the same stock of steel have passed long ago, and now we work in a special manner the metal intended for specific purposes.

Since the writer promised to answer all questions, we have had letters not a few regarding the various processes of tempering and hardening steel economically; many more have asked for information concerning the substance called tungsten, and inasmuch as this metal will play an important part in this and subsequent discussions, we will give a description as gleaned from the latest authorities. The name itself is derived from a heavy stone, alluding to its great specific gravity. The chief sources from which the metal is obtained are wolframite, a tungstate of iron and manganese very often found in connection with native oxide of tin, and is found quite abundantly in various parts of the United States, especially near Monroe and Trumbull, Conn., and in certain portions of Missouri, Georgia and Alabama. Then in schulite, tungstate of lime produces considerable of it. Again, in portions of the country producing lead we find tungstate of lead; of copper and lime, or cuproschulite; of manganese and iron, or megabarite; of manganese, or hereberite; as well as in the native oxides, tungstic ochre, and in small quantities in samarchite, etc.

With the supplies of this country one would think that the shipments of this ore from England, Russia, Bohemia, Bolivia, and other foreign ports to this country would cease; but we learn that most establishments using this metal import their supplies, though the deposits of Connecticut find ready markets near home. Our Southern and Western deposits, however, are not worked to any great extent as yet, something very strange when we take into account the quantity and ease of mining.

Possibilities of Further Improvement in Steel Manufacture.

A good quality of cast iron contains about 5 per cent of carbon. When this is all removed but say about 1 per cent we have steel. On the strength of this discovery, made by chemists not a great while ago, entirs new processes were introduced, and most of the best steel is now made from malleable iron; hence in some stage of the process connected with the conversion of cast into wrought iron the metal must have passed into the condition of steel. Notwithstanding this fact, which to us appears incontrovertible, the majority of our manufacturers deem it best to take all the carbon out of the cast iron, subsequently restoring by a tedious and expensive process, or rather series of processes, a mere fraction of what they have already taken out and thrown away. Here are opportunities for the greatest decrease in the cost of production, a question now keeping still and silent a large proportion of the steel-producing establishments in the United States, and as sure as the required cash is placed at the disposal of competent analysts and cautious investigators just so sure will the cost of converting iron into steel be decreased, the principal cost now being the expulsion of the innate carbon and subsequently replacing.

In conclusion, when we forcibly drive off this carbon, which in this respect assumes the character of extraneous matter, we leave its place unoccupied; hence the necessity of making shear steel from blistered steel. This cutting, heating and forge work is all attended with great expense of fuel and mechanical energy. Of course, we may make crucible steel, but this question of heat, power and loss of material again protrudes, and we find our goods on the market at very small margins for profit. Mr. Bessemer made a wide stride toward solving this problem; but stopped far short of ultimate success. He went sufficiently far, however, to work an entire revolution in the processes of steel manufacture; but the embarrassments and ridicule attending even his achievement are so well known that we need not discuss them; suffice it to add that the word Bessemer is already engrossed on tablets that ten thousand years will not efface.

CHANGING HARD INTO SOFT CASTINGS.—In a communication to the Academie des Sciences, N. Forquignon states that when whits iron castings are heated to a point a little under that of fusion they become transformed into gray iron. The change is due to the separation of carbon from its previous combination with the metal, and its deposition in the hulk of the casting. By careful experiments recently conducted, M. Forquignon has found the following results: He heated a number of white iron pige for 172 hours in a stove from which the gas was carefully exhausted, and afterward analyzed the product. The iron originally contained 3 per cent of combined carbon, while the material as taken out of the experimental furnace was found to contain only 0·895 per cent of carbon in combination, and 2·061 per cent of carbon in the graphite state. The change must have been due wholly to the slow and continued heating of the metal. It is not stated whether there was any perceptible difference between the outside and inside of the metal under treatment, which might be expected under such conditions. The process has a certain resemblance to the usual method of softening steel, in which the effect of continued heating is to decompose the mixture of pure metal and carbon.

The Use of Files.

Considered in the abstract, there is more real science connected with the use of a file than in its manufacture, though all are willing to accord to the progressive makers the praise due the improvements of this very important workman's tool during the past few years. To properly use a file is apt to be considered a system of education beneath the dignity of the smart apprentice, in fact it is rarely, if ever, that the apprentice is instructed in the use of the file at all save to be able to draw the tool smoothly across the article to be filed, regardless of the care of the tool itself. Indeed, we question very much if in a large shop there are many artisans who know how to preserve as well as use the file, the principal idea being to get a certain amount of work done regardless of the wear, often needless to a great degree, of the tool.

If we will take the trouble to examine carefully the make-up of a file, it will be noticed that it is among the impossibilities to so temper a bit of steel that after the same has been subjected to the treatment necessary to make the rough edges or "teeth," that the temper will be the same throughout; hence, if we wear it more in one place than another, it will soon refuse to do even work. Again, in drawing the file, when the tool is pushed from the operator, a certain proportion of the hard tempered metal is turned toward the operator, now, if in the backward motion the file is allowed to bear on the substance to be filed, it is crowded forward in proportion to the amount of force applied, hence, only a few strokes are needed to break off the outer or keenest edge of the tooth, whereas if the file was not allowed to touch the substance being filed, the steel would continue to bend toward the operator, and would wear off smoothly, and not become uneven or jagged along the outer edge, which soon condemns a file for fine work. Then, again, these minute and evenly made furrows in the best made tools soon become, as it were, clogged by means of the small bits of worn-off steel having the temper drawn by the heat generated by friction during rapid, hard work. These little particles soon aggregate to that extent that the file is rendered impotent for nice, even work, as shown by the great amount of rough filing seen in any shop where apprentices are allowed to file away regardless of the results as effects a continuance of the useful life of a file. These are little things of themselves, but in the aggregate they amount to no small amount in the cost of manufacturing.—*The Age of Steel.*

"POUNDING" IN HOT WATER PIPES.—This disagreeable noise is mostly owing to defects in planning the steam and return pipes, either in their position or relative size. Sometimes heating engineers are hampered by architectual conditions. Occasionally engineers are negligent in failing to blow the air out of the pipes. Much of the trouble arises from partially opening the radiators, causing the water accumulate in them, when upon fully opening such a radiator, the water rushes into the return pipe to disturb a whole building by its vibration. Much more of this trouble occurs in moderate weather, when in most large buildings a large number of radiators are closed or partially so; the connecting pipes leading to such radiators become partially filled with water, the vibration of which causes the noise.

POWER AND STRENGTH IN RELATION TO MACHINERY.—The machinery of an engine to work at 300 pounds must, only to do the same work, be seven times as strong as that which works at 20 pounds. Here, then, is a fatal objection against the use of steam at high pressure, unless it can be met in some way. This is where the advantage of compound engines comes in. While the pressure in the one increases from 76 to 438, the other increases from 63 to 112. Thus by the use of compound engines the pressure on the pistone can be kept quite within reason.—*Ex.*

THE WELDING CAPACITY OF IRON.—Dr. Wedding has been making experiments on welding which give some important results. He shows that capacity for welding increases with the amount of silicon present, and decreases with any excess of manganese. The latter acts by interfering with the crystalline structure of the iron, and confirms Ledebur's idea that all adventitious bodies influence welding in proportion to their amount.

ROTARY ENGINES IN DEMAND.—Rotary engines are coming more and more into general favor at the East, as is attested by the increased number of them that are being made and sold. One large manufacturer of such engines says that they are now receiving orders for from two to five of their rotary engines per week, and that those sold have given the highest satisfaction.

SCIENTIFIC PROGRESS.

The Santa Barbara Natural History Society.

We are pleased to note from a late number of the Santa Barbara *Independent*, that the Natural History Society of that town is in a flourishing condition. Its annual meeting was held on Nov. 25th, at which the president gave a brief review of the complete and interesting reports of the officers; dwelt upon the fact that the society is now fully equipped with a permanent home in these delightful rooms, the generous donation of the owners of the Library Building. He spoke of the growth of the society, its increase and interested membership; of the valuable additions to Library and Museum, especially the donations to the herbarium and the 400 land shells; also of the magnificent painting, the loving and gifted work of its honored secretary. He concluded by speaking encouragingly of the future outlook of the society, which, after all, would be just what its members might choose to make it.

The following officers were chosen for 1885: J. W. Calkins, president; Mrs. A. A. Boyce, Dr. S. B. P. Knox, and Rev. S. R. Weldon, vice-presidents; Virginia Forwerd, rec. sec; H. C. Ford, cor. sec.; Henry Muzzall, treasurer; Mrs. F. C. Lord, curator.

The curator reported a number of contributions to the museum and also to the library during the evening.

Cyclones for the Past Two Years.

Mr. Calkins read a few notes on cyclones which he had gathered during the past two years, and gave a quiet suggestion that it were well to bear some topic in mind, and note down the facts as they come under our observation, for future use. Of 600 cyclones occurring between the years 1794 and 1881, a period of 87 years, Kansas had 62, Illinois 54, Missouri 44, Iowa 32; New York and Georgia rank next. The general direction was from westerly to easterly; width, from 10 feet to 10,000 feet; average width, 1,085 feet; velocity, 12 to 60 miles per hour; average, 30 miles per hour. June is the cyclone month, April coming next. Of 217 recorded, 193 occurred in the afternoon, 1 at early dawn, one at sunset, 2 at noon, 13 in the evening, and but 7 during the night; greatest average of occurrence, between 5 and 6 P. M.; next, between 4 and 5 P. M.; and they usually occur in sultry weather. While it is stated that they never have occurred west of the Sierras, the membership demurred, claiming one bona fide one for Santa Barbara.

The Proposed Saharan Sea.

With reference to the daring French project for flooding the desert of Sahara with what would be virtually a new sea, it may be well, says *Engineering*, to recall the opinion expressed by M. Elisee Reclus, that at one period in the world's history the desert was covered by a sea very similar to the Mediterranean, and that this sea exercised a very great influence upon the temperature of France, as comparatively cold—or at any rate cool—winds blew over it, while now the winds which prevail in the great expanse are of a much higher temperature, and are, in fact, sometimes suffocatingly hot. The appearance of the desert seems to support the theory of M. Elisee Reclus, that it was at one time the bed of a sea of considerable extent, of which the great inland African lakes recently discovered are possibly the remains.

The present vast extent and configuration of the African continent would also appear to support the conclusion that at one time it comprised a less area of land than it does at present. The serious question which arises, assuming that the theory of M. Elisee Reclus is substantially correct, is: What will he the effect of the creation of a second African sea in the room of that which has disappeared? Would the temperature of France, and possibly even of England, be again reduced? It is a geological theory that in the glacial period of the world's history Great Britain was covered with ice and snow very much as Greenland is at present. Some great influences must clearly have been brought to bear upon France and Great Britain, which rolled the ice over so many hundred miles northward. What was this influence? Was it the large African sea which French enterprise is endeavoring to recreate? If it were, we should say that whatever the French may gain in Africa by the realization of a Saharan sea would be much more than counterbalanced by what they would lose in France itself.

THE CHANGE OF POSITION IN THE EARTH'S AXIS.—At a recent meeting of the Geographical Society of San Francisco, Vice-President Stevens read an interesting paper on the movements of the poles of rotation, or the change of position in the earth's axis, considered as the cause of earthquakes and the recent great convulsion of nature in Italy, Java and Alaska. The various causes which may be supposed to produce this change of position in the earth's axis of several degrees were considered, and their relative importance discussed. Chief among these causes were mentioned the deposits of immense bodies of sediment, as by the rivers of Thibet in Central Asia. The disputed question of the solidity or fluidity of the interior of the earth was also considered in its bearings upon the subject. The conclusion was that the problem presented was one difficult of solution, but this time might come when it would be so clearly demonstrated that the wonder would be why the matter had been thought so obscure.

The Position of Mountains.

It is a somewhat singular fact that the steep side of mountains is usually found on the side nearest the ocean. Dana, in his Manual, says that the position of the great mountain chains along the borders of the continents, and of uplifts, fractures, plications and volcanoes, are chiefly on the seaward slope of the chains, proving that while the force from contraction was a universal force over the sphere, the lateral pressure was vastly more effective in a direction from the ocean than in the reverse direction. Now this landward action of the force seems to be a necessary consequence of the fact that the crust over the oceanic areas was and is abruptly depressed below the level of the continental, so that the lateral pressure from its direction would have had the advantage of leverage beneath the continental crust, or rather, would have acted obliquely against it.

In the case of the Appalachians and the other ranges of the Atlantic border, the mountains front toward the ocean, that is, have their steepest folds on the oceanic side. The same is true of Andes in South America, and of our own Sierra Nevada Range along this position of the Pacific Coast. The same rule has a very general application on other continents. But there are exceptions. The Juras of Europe, on the contrary, front inland toward the Alps, and apparently because of their subordinate relations to the Alps, both geographically and genetically. In each case they were on the shoving side; while the greater fractures are usually toward the opposite side.

This condition of mountain deviation has nothing to do with the revolution of the earth, as some have supposed. It is the result of shrinkage, continental crumpling of the earth's crust. Of course this view is controverted by another class of writers, who attribute the mountains to the pressure of immense accumulations of sediments, which, however, does not seem to be sufficiently comprehensive. But the steep side of ranges is apt to be found on the oceanic side, as stated above, or toward the shoving side.

NEW FILTERS.—Two important filters are described in the *Journal de Pharmacie et Chemie*. The Chamberland filter consists of a porous cylinder of ground porcelain burned to such a heat that it is capable of transmitting liquids, but not solids. It is used in Pasteur's laboratory for separating microbia from their culture liquids. Pasteur has found that on filtering with it the most impure waters the germs of microbia cannot pass through it. In the Maigren filter the acting medium is a mixture of powdered hydrate of lime and of boneblack. This apparatus is said to be capable of removing not merely suspended but dissolved impurities.

TORNADOES.—It is a curious fact that tornadoes occur in the afternoon, 4 o'clock being called the tornado hour. They move from southwest to northeast, generally east about twenty degrees north, and their linear movement is ordinarily from thirty to forty miles an hour. Tornadoes occur on sultry days, or when the temperature is very high and the air is thoroughly saturated with moisture, and when the air is highly charged with electricity.

SECURE CORKS.—Tight-closing corks may be obtained by soaking good corks for several hours in a warm (about 50° C.) solution of 15 parts of glue or gelatin in a mixture of 24 parts of glycerine, and 500 parts of water. These corks may be made still more proof against acids, by dipping them, after being completely dried, for about ten or fifteen minutes in a warm mixture of 4 parts of paraffine, and 1 part of petrolatum.

THE FLOW OF WATER THROUGH ELASTIC PIPES.—A lecturer recently remarked that water or any fluid would flow more steadily, or produce a steadier stream, through an elastic pipe than through a non-elastic one, or in other words, through a rubber pipe than an iron one, other conditions being the same. If so, it must be because the elasticity of the pipe lessens the friction.

A SUBTERRANEAN OBSERVATORY.—Prof. Milne, of Tokio University, Japan, is about to establish a subterranean observatory at Takashima, in a very deep coal-mine not far from Nagasaki. The object is to determine the connection between earthquake phenomena and meteorological phenomena, such as storms, barometrical pressure, tides, tidal waves, etc.

PAPER BAROMETERS were first introduced from Paris, and can be made from soaking the paper in a solution of chloride of cobalt. It then becomes a hygroscopic. If it is now exposed to a current of air, it will change from blue to pink, according as the air becomes moist, regaining the blue as the moisture decreases.

NEW MATERIAL FOR PARTITIONS.—A scientific journal reports that a composition of sand, cork and lime moulded into blocks is now on trial in Germany for building light partitions. It is said to have the advantage of excluding sounds better than ordinary brick work, while being light and a good non-conductor.

MINING AND SCIENTIFIC PRESS.

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W. B. EWER.....SENIOR EDITOR.

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☞ *See Advertising Columns.*

Passing Events.

It may be noticed as of prospective benefit to California that there is now quite a demand for gold mines. It is not very pronounced as yet, but this summer there is little doubt that many sales will be made. The outlook for California mine properties is now as good as that in any other mining State or Territory.

They have had a little difference of opinion up in Idaho about the miners' wages question, which has attracted some attention, but the differences have been temporarily settled.

The Hanauer smelter, in Utah, recently burned, is to be rebuilt, but some of the other smelters are seriously talking of shutting down for a while unless the lead market improves.

The Wood River miners are shipping ore some 1,400 miles, all the way to Omaha, paying $25 a ton freight, and making money at that, while some of the local smelters are not running.

THE British army has now a field kitchen, the fire of which will go like that of a steam fire engine, and do its work while on the march.

An Increased Gold Product in California.

On account of the very low price of lead and copper and the discount on silver, there is now more of a demand for gold-mining properties than has been the case for some years. Attention is therefore being directed to mines in this State, and it is probable that we will hereafter experience an increase in the gold product rather than a decline.

The reasons for expecting an increase of gold product may be briefly stated as follows: First, we have the auriferous resources to warrant an early and very great expansion of the gold mining industry. The present output of this metal could, through the supplying of additional plant and the opening up of new mines, be doubled with profit in less than two years. Hardly more than one paying quartz lode in ten known to exist in the State has yet been brought into a productive condition. There is, to be sure, renewed interest and much activity being manifested at present in this branch of mining, and on this fact is based in large measure, our expectation of an increased gold production in the early future, there being good reason to anticipate for these efforts a generally favorable issue.

As we have auriferous quartz in such abundance, so also does California contain a great extent of unworked placer deposits, these latter having been exhausted only where they could be most readily reached and easily worked; such as the shallow prairie diggings, the gulches and raviues, including some portions of the river beds and most of the bars along the streams. This class of deposits, have for the most part been worked by methods and appliances so simple and inexpensive that it is a misnomer to call this kind of operatious mining at all. But having served their purpose, removing and working the material most easily reached, there still remains in this State, besides the innumerable quartz lodes, thousands of acres of hydraulic gravel banks, hundreds of miles of the old Pliocene channels and long stretches of the modern river beds untouched or but little worked, to say nothing of dry diggings, virgin because no water has ever been brought upon them, or the deep-lying basins that could not be worked for want of drainage. The time is coming, too, when the immense bodies of tailings that have accumulated along the rivers and gulches of California will be re-handled with profit, and the auriferous sands that stretch for so many leagues along her sea coast, will be turned to practical account. To fully occupy the field here opened to capital and labor will require a great many years; to exhaust it of its resources will be the work of many generations, perhaps of centuries. The enduring qualities of quartz mining in California find illustration in the Sierra Buttes property, which, after being steadily and profitably worked for more than 30 years without any sign of exhaustion, is yielding now more ore than ever before. Grass Valley, where quartz first began to be extracted and where this class of mining has been prosecuted for 33 years with energy and persistence is to-day the most prosperous quartz mining district in the State. The Empire mine, which turns out annually a million in gold, is situated on that section of the Mother Lode that has been worked extensively and without intermission for 25 years, these being only a few examples that might be cited, all of similar purport.

That a good deal of money has been heretofore lost in gold mining operations in California, cannot be denied. But such losses, while far less than have occurred in many other countries, are not going to happen to any great extent in this State hereafter. As before remarked, we have learned here the business of gold mining pretty thoroughly. We have brought our processes, methods and machinery to great perfection. Profiting by experience, we avoid now many of the mistakes of the past, practicing an economy, caution and system that only a few years ago were in most cases disregarded. In these improved conditions investors have assurances of larger returns and better general results in the future.

ABREAST OF THE TIMES.—THE MINING AND SCIENTIFIC PRESS, Dewey & Co. publishers, San Francisco, *the best* and most influential mining and scientific journal on the Pacific Coast, has just entered its sixtieth volume. It deserves and should receive the support of our mining community whose interests it zealously advocates. Terms $3 a year if paid in advance. —*Mountain Messenger.*

Measurement of Water in California.

Throughout this State great confusion has arisen from the absence of a generally accepted unit of water measurement in the system of distribution, from irrigation and mining ditches. There is a wide divergence in the customary methods of ascertaining what is known as the "miner's inch." As concisely stated by Mr. Aug. J. Bowie, Jr., in a paper on "The Measurement and Flow of Water in Ditches," read not long since, before the Technical Society of the Pacific Coast, and published in these columns, this term, as currently used, denotes "a quantity, which varies in almost every district in the State; no one gauge has been uniformly adopted, nor has any established pressure been agreed upon under which the water shall be measured. In some counties there are 10, 11 or 12-hour inches, and in others there is a 24-hour inch. The apertures through which the water is measured are generally rectangular, but vary greatly in width and length, being from 1 inch to 2 inches wide, and from a few inches to several feet long. The discharges are through 1-inch, 1½-inch, 2-inch and 3-inch planks, with square, or with square and chamfered edges, combined or not, as the case may be. The bottoms of the openings are sometimes flush with the bottoms of the boxes, sometimes raised above them. The head may denote the distance above the center of the aperture, or that above the top, and varies from 4½ inches to 12 inches above the center of the aperture," etc.

The advantages of our uniform standard in designating the quantity of water served are so generally appreciated as to require no special comment; but steps have been taken to suggest to the Legislature the adoption of a standard unit of measurement of water, and of one or more gauges for the accurate determination of the discharge.

It is thought purposely to establish a unit such as the "miner's inch," incorporating the element of time as well as of volume, without prescribing a fixed form of apparatus for its measurement. This seems scarcely practicable, as the conditions of allowable drop or head and quantity, to be delivered, vary so widely that no one form would be general in its adaptability.

It is believed that a simple volume unit, such as the "cubic foot," will be preferable to the "miner's inch," or even to the "cubic foot per second." It will be more general in its application and admit of the meter system of measurement.

No advantage would be sacrificed by the substitution of such a unit for a "miner's inch." The existing forms of gauges could still be effectively used. It would be necessary, however, to know definitely the number of cubic feet which the form of gauge used would deliver in an hour or a day under specified conditions; but provision could be made for this necessity by the recommendation of several permanent forms accurately described and authoritatively tested as to rate of delivery. In cases of controversy it might then devolve upon persons using apparatus other than those recommended, to establish their rate of delivery.

These considerations have been discussed by a committee of the Technical Society of the Pacific Coast, and the society has authorized its committee to petition the Legislature on the subject. This committee is composed of such well-known engineers as Col. Geo. H. Mendell, Geo. J. Specht, Aug. J. Bowie, Jr., Ross E. Browne, W. R. Eckart and Geo. J. Allardt. The petition asks for the passage of an act looking to the future establishment of the cubic foot as the legal unit of measurement of water, and to this end providing for the appointment of a Commission of Engineers (of which the State Engineer *ex officio* shall be a member), to serve without pay, whose duty it shall be to make experimental tests of one or more forms of gauges for the accurate determination of their discharge of water, and to submit, in writing, to the next Legislature a report embodying the results of such investigations and their recommendations. It is the opinion of the committee that an appropriation of $3,000 will be sufficient to pay the expenses of the investigations and the necessary experiments. The matter is a highly important one, too long overlooked, and it is to be hoped that the Legislature will comply readily with the request as above set forth.

THE vaults at the Sub-Treasury of San Francisco are taxed to the fullest capacity.

Utilization of a New Mineral Substance.

A company has recently been organized in this city, and erected extensive factories at Shell Mound, on the line of the C. P. R. R., for the purpose of manufacturing a material which possesses several peculiar characteristics, the basis being a mineral substance found in this State, but hitherto not utilized. This substance has the appearance of mineral pitch, but possesses rather the characteristics of rubber. It is not at all like asphaltum or coal tar. It is black in color and elastic in texture. Treated by a special process and mixed with a suitable solvent, it is converted into a liquid and can be applied with a brush. In this manufactured condition it is called "paraffine paint," under which name it is sold.

Its peculiar characteristics are such that it is applied for several different purposes. It does not oxidize, is untouched by acids or alkalines, is elastic, waterproof, and to some degree resists the action of heat. The material is applied cold, like any ordinary paint, and when dry does not rub off, and there is no odor to it.

An important use for this is in painting iron or tin for roofing or other uses. It seems to go into the pores of the iron, and does not scrape off, as ordinary paint is apt to do. The roof of the C. P. R. R. depot at Oakland mole has been painted with this substance. There is no corrosive action. Even rusty iron, like stove-pipes, etc., painted with it appear as if japanned, and farther rusting is stopped. The mineral itself is deposited, the solvent evaporating.

Applied to such substances as bricks, it penetrates in such a manner as to enter the pores and prevent absorption of water. This is good for foundation work. Submerged timbers coated with it are also preserved. At the Oakland ferry slip, timbers painted with it three years ago are in a good state of preservation.

Rigging, ropes, fishing lines, etc., coated with this substance are waterproof, so they will wear longer. Applied to canvas for tarpaulins, etc., one coat waterproofs it without stiffening or injuring the fabric in the least. A paper bag painted on the inside will hold water for an indefinite period.

A roofing is made from burlaps soaked in this paint, which is perfectly water-tight. It is made in rolls and is tacked on, and is very useful for temporary structures, etc. Small sheets of this, with the joints painted with the same paint, are also made for roofing purposes. The simple paint alone on tin or iron roofs prevents decay.

The most curious feature of this substance is its applicability to leather. It renders boots, shoes, gloves, etc., waterproof, while they are at the same time pliable, and can be used for belting, harness, etc., as well. The rubber gloves and hoots used in acid factories, etc., wear out in a few weeks, but when made of leather covered with this paraffine paint they have lasted several months. Experiments with all acids and alkalines have so far failed to find one which will affect this paint. The plumbers are using it in soil pipes, to prevent the action of ammonic.

The paint does not seem to injure fabric, metal or wood in any way, but rather preserves it. Experiments were made for several years before the company was organized, and since the factory was started large quantities have been sold. In addition to the C. P. R. R. using it in various ways, the new Selby smelting works roofs are being painted with it, the California powder works, etc. A number of leading citizens are interested in the company, among the directors being W. T. Garratt, J. B. Randol and Joseph Powning. Among others interested are Joseph Eastland, Col. G. H. Mendell and E. B. Dean. The office of the company is at 310 California street. Large quantities of the paint have been made, and the factory adds one more to the increasing home industries of the State.

THE Supreme Court has granted the writ of prohibition prayed for in the case of the Chollar Mining Company vs. Wilson, Judge. It is held that "a majority of the stockholders" and "the holders of the majority stock" is the same thing. Both are used in the act. This is held to be decisive of the cause. The argument as to results is entitled to little weight. The suit was originally brought to prevent any change in the officers of the company.

The Wood River Mining Region.

We had a conversation this week with L. A. Dithmer, of Bellevne, Wood River, who has been engaged in miniug there since 1879. From him we gather the following facts concerning the mineral resources of the region:

The Wood River mining region is situated in Alturas county, Idaho, and extends from the Wood River hottom and Camas Prairis north about 40 miles, and about 25 miles east and west of Wood River.

Mineral has heen known to exist in this section since 1863, hut owing to its isolated position, and being an Indian country, and galena ores not being at that time considered of much value, no attentien was paid to it until 1879, the year follewing ths Bannock war, whsn several prospecting parties entered this then wild country. A number of claims were located that year, but owing to ths difficulty of obtaining supplies, very little work was done, and but few remained throngh the followiug wintsr. The news that rich ores had been discovered, soon spread, and the spring of 1880 saw a great rush to this newly found El Dorado. During that year most of the richest miues now being worked were located.

The geologicel formation of thie section is limestone and granite; the mines are principally galena ledges.

Tho galena mines lie on three helts, divided hy a granitc dyke of from one to threo miles in width. They follow the contact of the formation, and are, with hut few exceptions, found in tho limestone formation. The course of these leeds varies from an eaeterly and westerly to a southeasterly aud northwesterly direction, with a dip to the southward, and the outcroppings can he followed for miles.

The orc in the Wood River mines, unlike that in the Utah and Nevada galena miues, is in continuous veins, like those of Colorado near Georgetown. The galena contaius gray copper, and assaye very high. The ores shipped will average 150 ounces of silver, 70 per cent lead, to the ton, but ee greater depth is reached the ore contains more gray copper and grows richer.

Minerel Hill District, iu the lower helt, ie the first we rcach going into the Wood River region on the Wood River branch of the Oregon Short Line Railroad.

The road runs through Bellevue, a town with a city charter and a population of 2,000 souls. About one mile west of Bellevue, on the west side of Wood River, is the town of Broadford, a mining town with a populetion of 800. Five miles north of Bellevue hy railroad ie the town of Hailey, the county eeat of Alturas county, with 1,500 population, and seven miles west of Heiley by wagon road ie the mining town of Bullion, with 800 population. These are the headquarters and supply stations of Mineral Hill District, that has so far got the greatest number of developed mines, and exteuds from about six miles southeast of Bellevue 20 miles in a northwesterly direction.

About 15 milee north of this district we come to Warm Spring Creek District, with the town of Ketchum, the terminus of the Wood River branch of the Oregon Short Line, and a population of 1,200. The mines here extend ahout eight miles in a southeaeterly direction, taking in the east fork of Wood River, and ahout 12 miles in an casterly direction up Warm Spring creek. The mines and the country formation correspond with those of Mineral Hill District, and ie next to that the most important mining district iu thc Wood River region.

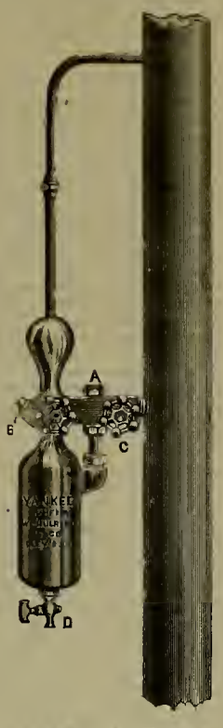
Ahout 20 milee north of Ketchum at the head of Wood River is situated the town of Galena, in the Wood River District, where are located a numher of good mines and prospects.

Ahout 20 miles west of Ketchum and 25 miles northwest of Bellevue is the Smoky Mining District. The ledgee here are large and well defined; the ore is of a high grade galena intermixed with gray copper, and will go from 100 to 500 ounces in silver per ton, and from 30 to 70 per cent in lead. The country formation is lime and granite. Placer mines have also heen worked here for years with good reults.

North of Smoky, and west of Wood River district ie the Sawtooth district. The mines here are silver hearing quartz ledges; the ore is of a high grade, and is reduced on the ground. The country formation is granite. The towns of Sawtooth and Vienna, each with 300 to 400 inhabitants are the headquarters of this district.

Twenty miles east of Bellevue by wagon road is the Little Wood River district, with the town of Muldoon as supply station. The ledges here are also lergo and well defined, the ore is galena end carbonate, the country formation limo and granite. The Weod River mines can be worked cheaply, the ground is favorable, drifting and sinking can be done for from $5 to $10 per foot. Wood and water is ahundant; plenty of the best grass grows everewhere for stock.

Camas Prairie and the Wood River velley have got the best of agricultural lend to raise



THE "YANKEE" SIGHT-FEED CYLINDER LUBRICATOR.

everything the market requires. Good wagon roade counect all the district with railroad communication, at Bellevue, Hailey and Ketchum. Ahout $3,000,000 worth of ore wae shipped from the Wood River country during the year of 1883, and ahout $4,000,000 or $5,000,000 worth in 1884. The greater portion of this ore is shipped to Omaha, a distance of ahout 1,400 miles hy rail. The ore shipped is pure. Any ore containing waste is concentrated at the mines at a cost of ahout $1 per ton. Most mines have their own concentrator and can work low grade ore to a profit that formerly was considered worthless.

The permanence of the Wood River mining region is now estahlished heyond a doubt, though developments are only in their infancy. Many prospects, which show as well as did any of those now developed, are lying idle, waiting for capitel to develop them. They can he secured now at nominal figures. All mines were once hut prospects, and hut a very limited numher of the prospects in Wood River have heen at all developed, and those that have heen which showed ore at the top, have grown richer as the work of development has proceeded.

The "Yankee" Lubricator.

The accompanying engraving represents the "Yankee" light-feed luhricator, for locomotive and stationary engines and machinery of all descriptions. The device is quite simple in construction, and heing of one solid piece of metal, has no joints to leak and cause trouhle.

It hae no internal tuhes to become clogged with sediment and render it irregular in its action. Its feed is regular, and can he gauged to as many drope per minute as may he required, and which are plainly shown in the glass.

Each cup is put up under our own personal supervision, and suhjected to 200 pounds cold water preseure hefore leaving the works. The nut *B* is taken off and its oil is filled in, wheu the nut is ecrewed on again. The valve *C* regulates the drop in the glass. H. P. Gregory & Co., of this city, are the sole agents for this coast for this lubricator.

An Improved Step-Ladder.

The engraving accompanying this represents an improved step-ladder, just patented through the MINING AND SCIENTIFIC PRESS Patent Agency by Layton S. Tibbals, of Mission San Jose, Alameda county. As will be seen, the bracing is quite peculiar, so the legs are kept separated when in use, but may fold togetber readily when being transported. This makes the ladder very safe to use.

The step portion of the ladder is made in the usual wey, the folding legs being suitably hinged at ths tep. The braces or brace-legs, *b b*, cousist of two parallel strips, preferably connected together as shown. The tops of these braces are hevcled te the angle of the inclination of the sides of the front portion, as shown at *a*, whereby they are adapted to he close thereto, and they are connected with these sides by links pivoted to both hraces and sides. The distance between ths pivot points of the links is snch that when moved upward to and heyond a horizontal position they throw the braces less away from the sides; hut when the hraces are in close contact with the sides, the links lie parallel with and alongside of the breoes.

The lower ends of the hraces are heveled to lie flat upon the floor, and the lower ends of the legs are hinged to the hraces, as shown at *c*, in such a manner as to ellow both pairs of legs to fold towards and lie parallel with the front, while at the same time the legs are furnished with support hy thc hraces when opened, es shown. Tbe hinge Mr. Tihhal prefers to use consists of a bracket secured to the hraces and having pivoted hetween its ears an arm or strap which is secured to the legs. This forms a simple and strong hinge connectiou, the further advantsge of which lies in its ready applicability to any etep-ladder.

The braces, with the hinge or links attached, may be made in qnautity and sold, for the application hy the owner himself to his ladder, the only adjustment required heing the shortening of the legs and the attachment by ecrews or holts of the liuks and arms of the hinge to their respective parts.

When the ledder is opeued out for use the weight ie mainly directed downward against the tops of the hraces, which, by lying close to the sides of the front, are in position to resist the strain, and cannot yield without moving away from the bearings, which they cannot do against their links, and the strain or weight exerted downwardly through the legs.

As the person using the ladder descends, he

TIBBAL'S IMPROVED STEP LADDER.

presses with his thumbs against the tops of the braces, aud throws them hackward and upward away from these bearings, whereby tho two paire of legs ean he folded against tbc front. For farther information the inventor can he addressed as ahove.

OIL AND GAS NEAR THE CANADIAN PACIFIC RAILWAY.—Telegraphic reports announce the discovery of natural gas and oil in Manitoba, and directly upon the line of the Canada railroad. The find also indicates the existence of coal in the near vicinity. It ie more than prohahle that the discovery may he an important one.

Future Production of Gold and Silver.

As affecting questions of finance, it becomes a matter of interest to know in what proportions gold and silver are in these western countries likely to he produced in the future. Of course, the factors that enter into this problem are more or less speculative; yet it is legitimate to discuss the question accordiug to the best lights before us. Iu tbe first place, then, we ere of the opiuion that a small, but steady increase in the gold product of Californiu may for some years be counted upon. But, while this is likely to occur in California, we cannot see where else on the North American continent, a similar result can reasonahly he looked for, unless, perhaps, Alaska may yield more of this metal than is just now expected. It was thought tbat Dakota would have increased instead of diminishing her output of this metal last year. But, it looks now as if that Territory may have about reached her extreme limit of gold production. Now, after leaving out California and Dakota, the gold product of all our other Pacific States and Territories is comparatively small—less thau nine millions, all told. Obviously, then, the production of gold is not now keeping pace with the development of our other material intcrests, nor is it likely to do so hereafter, even though fostered and encouraged by all legitimate means.

The production of silver, however, though it has not undergone any marked enlargement during the past few years, is destined to see a more rapid growth; and if uot interfered with hy a suspension or curtailment of its coinage, promises to increase at about the same rate as other great staples aud the general busiuees of the country.

Mexico, which produces but little gold, has during the past teu years turned out annually about $23,000,000 in silver, which amount will hereafter be largely added to. But as such increase will hardly more than meet tbe growiug husiness wants of thet country, it will not add much to our own stock of that metal.

As regards lead and copper, they are commodities so reguleted by the law of demand aud supply, that their production, whether large or small, nced not be considered in connectiou with questions of finance or economy. Just now there seems to have beeu an over-production of these metals, more haviug been made thau the market can absorh at living prices to the producers. For the present the output must stop about where it is, and tbere remain until such time as a reduction of stocks on hand, the growth of other industries, supplemented, perhaps, by the finding of new uses for these metals, shall make a further increase possihle.

Sierra County Mines.

Very encouraging news has been received from the Bald Mountain Extension mine, in Sierra county, this week. From a private letter we learn that the incline will he in working order this week. A few men have already resumed working. Everywhere the bed rock is level and gravel equally wet, averaging from $4 to $5 per carload—a sure indicatien of an immense body of gravel and the richness signifies that they are now iu a wide beud of the channel followiug it up the ridge through the center of the ground. After the 1st of February there will not be an idle man willing or able to work, iu Forest City, whose people are in a fever of excitement and enthusiasm over the prosperous future now assured for their enterprising towu. All this will give a fresh impetus to prospecting for miles and miles up the ridge to the rich quartz ledges the mother of gold—in and around the Sierra Buttes. The Rainhow Company expressed below the other day $3,000, extracted from their late rich ledge extension. The Ruby Company are employing all the men they can obtain, and the Bald Mountaiu Company are dowu 125 feet, with their incline under the lava flow that cut the channel above, and in hard, blue-colored gravel, very rich in gold. The truth of the old saying, "It never rains but it nours," seems to be verified by these encouraging developments of the mineral resources of old Sierra.

From present prospects the Rainhow miue, at Alleghany (Sierra county), will soon bo proved valuahle property, as gold-heariug quar z has been found in the tunnel, 500 feet helow where the ledge was last worked, and of of a similar character as that above, proving it to be an extension of the pay chimney. This county has innumerable rich ledges undeveloped, only awaiting the assistance of capital to make them the most lucrative investments in the State.

Arizona Copper.

The Copper Queen is one of Arizona's most noted and most productive copper mines. The mine turned out in 1884, 7,500,000 pounds of copper, but no gold, silver or lead. During the same time they reduced 30,000 tons of ore. They employ on the mines and works about 175 men, at wages of $3.50 per day. From the report of the company for the fiscal year ending in April last, we find that the average yield of ore in black copper was 13.45 per cent; and average yield of refined copper was 96½ per cent. The company now has a contract for hauling coke, copper, etc., between Bodie and Fairbanks, at the rate of $725 per ton each way, a reduction of 45 cents from the previous year's rates.

The following summary of operations for the year ending March 31, 1884, will give a good idea of production, cost, etc., at this representative mine.

ORE.	Tons.
On hand April 1, 1883	414
Mined during year	33,961
Smelted during year	33,940
On hand April 1st	435
COKE.	
On hand April 1, 1883	97
Received during year	6,368
Consumed during year	6,382
On hand April 1, 1884	83
WOOD.	Cords.
On hand and received	3,792
Consumed in year	3,616

The 33.940 tons of ore smelted during the fiscal year yielded an average of 11.26 per cent in black copper, and produced 7,647,488 pounds, 96.3 per cent fine.

The net New York value of bullion produced was $1,033,045; total of operating, freight, refining and administration expenses, $690,099; net profits, $342,946, which, with the surplus added April 1, 1883, leaves $609,974 profit. Out of this dividends to the amount of $450,000 were paid, leaving a balance of $159,974.

A resume of the business of the company from April 2, 1881, to April 15, 1884, shows the following:

Value of product	1881–1882	$1,020,859.72
Value of product	1882–1883	1,314,973.25
Value of product	1883–1884	1,033,045.62
Total		$3,368,878.59
Expenses	1881–1882	$532,733.33
Expenses	1882–1883	761,071.13
Expenses	1883–1884	690,099.55
Total		$1,983,904.01

Deducting these expenses shows the net earnings for these years to have been $1,384,974.58. From this the company paid $300,000 in dividends in 1881–1882, $475,000 in 1882–1883, and $450,000 in 1883–1884, a total of $1,225,000, leaving a surplus of $159,974.

Referring to this subject, the *Engineering Journal* says:

In examiniug the reports of different Arizona mines, such as the Copper Queen, the Old Dominion and the Arizona Copper Company (formerly Longfellow), we feel justified in saying that every pound of copper laid down here does not cost them more than from 8½ to 9½ cents—probably less—although they have to pay ridiculously high prices for coke and heavy freight on their shipments of copper. For instance, the Old Dominion Company pays about $60 a ton for coke; uses one ton of coke to the ton of black copper—equal to three cents on each pound of fine copper. If a railroad branch should be built to Globs, coke could be delivered at perhaps from $20 to $25, causing a saving of from one and three-fourths to two cents per pound of copper, and the cost of copper would further be reduced by similar freight reductions on the copper material. Evidently the Arizona mines are in shape to compete effectively with the Lake Superior and foreign mines, and even to beat them. Their ores require only one process to make black copper of about 97½ per cent copper contents. How long this cheap production will go on depends entirely on the ore reserves and the quantity of deposits of carbonates in this region. Searching for such pockets is, of course, a very expensive job.

Park City Ore Shipments.

The shipments of ore from the two samplers, (Mackintosh's and the Crescent) for the year 1884 amounted to 35,824,771 pounds, or nearly 18,000 tons. These shipments have been made principally from the Crescent, Ontario, Daly's, Sampson and the Apex mines. The amounts from each being in the order of the list, the Crescent being the largest shipper. The prospects are that the shipments for 1885 will be fully double if not treble this amount, as Daly's mine did not ship any great amount of ore until the latter part of the year, and from present indications it will in all probability be the largest shipper during the coming year. The average price of the ore shipped was about $60 per ton, making over $1,074,720 worth of ore shipped, and this we consider a very low valuation. Besides this enormous amount of ore shipped we have in addition some 20 tons of ore from the Ontario that is worked at the mill and converted into bullion. This ore will averags in the neighborhood of $95 per ton, making a grand total of about $2,974,720 worth of ore mined in this camp.—*Park Mining Record.*

Preparation of Pure Silver.*

Dissolve the thoroughly washed chloride from the humid assays, or from the parting acid treated with salt or hydrocbloric acid, in warm, strong brine of common salt. Filter the solution into a porcelain or glass dish (a wash-basin will serve.) In the middle of the dish place a smaller porous vessel containing salt brine, with a very little nitric acid. (For a porous vessel a bessian crucible, which has stood full of water until soaked through, will answer.) Cut a piece of sheet copper of such a size as to form a cylinder, which can be placed in the porous vessel, not touching the side. From one edge of the copper cut a narrow strip, but not entirely off, leaving it connected to the sheet. Take a strip of test silver long enough to form a ring around, but not touching the porous vessel, and from the edge cut a strip partly off, as with the copper. Clean the copper by immersion a for few minutes in dilute nitric acid and then in water. Connect the copper and the silver by soldering the ends of the strips or by folding them together. Bend the plates suitably, and place the copper in the porous vessel, the silver in the basin containing the solution of silver chloride, the connecting strips forming an arch above the liquids. Keep the whole warm, and if necessary renew the solution in the porous vessel, or add a little acid from time to time.

Pure silver, in the form of small white crystals, will be disposited on the silver plate. Iron or zinc in the porous cell would work faster than copper, but would not give pure silver, as they would cause the precipitation of any trace of lead, copper, etc., which might be present, as well as of the silver. If pure silver for a plate cannot be had, a piece of coke may be used instead, being connected with the copper by means of a copper wire soldered to that, and wound around a notch cut in the coke above the liquid.

The precipitated silver should be washed, first with hot water containing some salt and a *little* hydrochloric acid, and then with pure hot water until that gives no precipitate on addition of solution of silver nitrate. If destined to be melted, the silver may be dried by evaporation after draining; otherwise it should be first pressed between sheets of filter paper, and then dried by heat, and kept in a stoppered bottle.

The dried silver may be melted in a clean, black-lead pot, or in a clay crucible lined with charcoal, a little borax being added, and cast into narrow bars like those of solder. The bars may be cut into chips by the chisel or laminated by the rolling mill, after being reduced to a thickness of about one-fourth inch by hammer and anvil, being cut into suitable lengths, and annealed whenever necessary for the rolling. The filter through which the solution of silver chloride in brine was passed may be dried, dressed with litharge and borax, smelted in a crucible, and the resulting lead button cupelled for recovery of gold. To line a crucible with charcoal, beat in, little by little, finely ground and slightly moistened charcoal until the pot is filled; then scoop out the central portion, leaving a lining about half an inch thick, more or less. Smooth the interior by means of a glass rod or a test-tube.

—From Aaron's Assaying, now in press, published by Dewey & Co. Price $2.

Fineness of Sierra County Gravel Gold.

The following table shows the fineness of gold in various parts of Sierra county, California:

Alleghany	900
American Hill	935 to 950
Bald Mountain	915 to 959
Balsam Flat	880
Canyon Creek	880
Cedar Grove	930
Chaparral Hill	905
Chipps' Flat	880
City of Six	900
Chandlerville	920 to 940
Cold Canyon	918
Craycroft	880
Deadwood	840
Downieville	885
Eureka	840 to 905
Excelsior	905
Feather River	870
Fir Cap	828
Forest City	900
French Ravine	800
Gibsonville	900 to 936
Hepsidam	900
Hopkins' Creek	915
Howland Flat	900 to 909 to 919
Kanaka Creek	860
Ladies' Canyon	884
Middle Yuba	874
Monte Cristo	905
Minnesota	880
Near Sierra Buttes	920
Nebraska (blue lead)	935
Nelson	887 to 605
Oregon Creek	830
Poker Flat	800
Pine Grove	920
Potosi	912 to 919
Poorman	910
Port Wine	935
Ravines near Laporte	900
Richmond Hill	910
Rock Creek	900
Sawpit Flat	910
Slate Creek	900 to 880
Smith's Flat	825
Spanish Ranch	945
St. Louis	900 to 925
Sweet Oil Diggings	875

LEAKS in roofs, about chimneys and elsewhere, may be stopped by thickening white-lead paint with fine, clean sand. Openings are easily filled with this cement and become durably watertight.

The San Juan Country.

Of San Juan county the local papers look with much satisfaction on the output of the year. The Silverton *Miner* says a vast amount of dead work has been done with splendid results, and a number of properties placed in position to eclipse all past performances in the way of production. The entire district has been subjected to numerous and serious drawbacks, but in the face of everything the showing is a much better one than was presented at the close of 1883. During the early part of the past year the fall of snow was almost continuous, rendering inaccessible until late in the fall sections that would otherwise have received attention and development. The most direct inconvenience resulting from the washouts was the failure of a number of companies to resume operations, the agents of which had stated that work was to be resumed. These several drawbacks not only interfered with outside parties coming in, but had a very depressing effect upon those who were on the ground and contemplated extensive development. Instead of the extensive operations contemplated early in the year, very little beyond the necessary amount of work requisite to hold a claim was done. The comparative stagnant condition of the mining industry extended to all other branches of business, and as far as the number and amount of transactions are concerned, the year has been disappointing. What development has been done, however, has been of the most satisfactory nature, and although the actual production of the county was greater than the year before, the inactivity in tributary camps situated in adjoining counties was such that the business here was very sensibly affected. A resume of the past year's operations, to be complete, would necessitate the description of the work done on over one hundred properties that have received more or less attention during the twelve months just closed, but this is out of the question.

English Bullion Market.

The private circular of Mocatta & Goldschmidt, of London, reviews the market in England for silver and gold for 1884. At the close of 1883, silver 925 fine was quoted at 51d. In January, the price fell to 50⅞d, but on the 22d of February it had advanced to 51⅜d, the highest figure for the year. It kept at 50d and upwards until October, when it fell to 49½d, the lowest for the year. The average for 1884 was 50 11–16d, against 50 9–16d in 1883. The sources of supply were the United States, Mexico and South America. The imports from the United States were less than in 1883, but more was received from Mexico and South America. The movements in both silver and gold for the year compare as follows:

	Silver.		Gold.	
	Imports.	Exports.	Imports.	Exports.
1877..	£20,000,000	£19,000,000	£15,000,000	£20,000,000
1878..	11,000,000	11,250,000	21,000,000	14,000,000
1879..	10,500,000	11,000,000	13,250,000	16,500,000
1880..	6,500,000	7,250,000	9,000,000	11,500,000
1881..	9,700,000	7,000,000	10,000,000	15,500,000
1882..	9,100,000	8,950,000	14,350,000	12,100,000
1883..	9,300,000	8,700,000	7,700,000	9,525,000
1884..	9,535,000	9,720,000	10,870,000	11,725,000

In the first two months of the year Spain, Egypt and South America drew heavily on the gold supply of England, but the loss was made good by free imports from America in March, April and May. Later on an outward movement set in, and much of that received in the spring and summer months was lost. An anomalous condition of things was the import of only £740,000 in gold from Australia, while £900,000 in sovereigns was sent to Australia. India took £1,400,000 in fine bars. The imports from South Africa were £430,000, against only £170,000 in 1883.

UTAH SILVER.—The year 1884 shows that there has been a falling off in the value of lead extracted from the mines of Utah, as compared with 1883, there has been an increase in the yield of silver of nearly or quite $1,000,000. Thus, while the agriculture of the Territory has not been profitable as a whole, mining has kept business on an even keel, and saved the Territory from what, without it, would have been a year of disaster. In all human probability, two more great producing mines are about to be added to Utah's list. In the 80 mining districts of the Territory hardly anything is being done except in six or eight of them. The remaining are waiting for the nerve and the capital which will storm their stubborn hills and compel them to give up their treasures.

The great hope of the Territory lies in its mines and the manufactures which should be established.

SOME NEW SILVER MINES.—Late important discoveries are reported by a party of prospectors in the old Waucoba District, Inyo county. The ore is silver-lead, closely allied to that of Cerro Gordo, and the mines are considered to be on the same belt. A series of assays made at the Elna furnace shows an average of 144 ounces silver per ton and 59 per cent lead. The mines are entirely new discoveries and unopened as yet, which may be counted a very decided advantage in that country. The ledges are large and long, in a formation most favorable for extensive deposits. The country is well wooded and watered, and distant from the C. & C. railroad about 40 miles, via a passable road across the Inyo mountains. As usual, the owners are financially unable to put up smelting works, and parties on the lookout for such investments might do well to investigate the new find.—*Bodie Free Press.*

Colorado Coal.

Three years ago it was known that coal existed here in great abundance, but none of it had ever been mined. At that time we were glad to get in and out of here in stages, wagons, on foot or any way that we could. As to the result of the change in these years we will give you below the figures to show the amount of coal and coke mined and shipped at this place.

The Coal shipments from crested Butte for the year ending December 31, 1884, are as follows:

Monthly shipments	Coke tons	Bituminous tons	Anthracite tons
January	1,280	2,440	2,720
February	110	110	620
March	30	1,870	240
April	40	2,800	——
May	800	2,220	——
June	670	2,020	40
July	1,280	2,190	60
August	1,660	3,150	530
September	1,840	3,340	2,600
October	2,020	3,380	3,110
November	2,260	3,670	3,980
December	2,700	3,060	3,630
Total shipment	16,790	30,220	17,550

It will be remembered that we had a terrible explosion here last January, and this coupled with the severe winter is the reason that the shipments were so light last spring. In fact the Antbracite mine was shut down entirely for six months of the year.

Recapitulation.

	Tons.
Anthracite coal	17,550
Bituminous	30,220
Coke	16,790
Precious mineral	1,070
Total	65630

In order to remove this amount of freight it requires 6,563 cars, which was an average of eighteen cars per day for every day in the year. During the last two or three months the car load shipment has averaged 33 cars per day for every day in the month. If that ratio could be kept up the year round it would very near double the present year's shipment, and this ratio would be kept up if it were not for the severe weather and unforeseen accidents.

Last year there was shipped from Pennsylvania to the Missouri river and west, nearly one million tons of anthracite coal. This year we supply 17,500 tons of this amount, and what would it be if we supplied even the half of this amount, which we ought to do?

Silver in Georgia.

A New York *Tribune's* special from Spring Lake, Ga, says: The late discovery of huge veins has now been supplemented by the discovery of silver in wonderful yield. There is great excitement in that section, and men are flocking there from all parts of the country. The most valuable deposits yet known are on the land of Mr. Tyler. A shaft 6 feet deep, 4 wide and 20 long has been sunk under the superintendence of an old miner. The vein is at least 1,500 feet wide, 300 deep and 28 miles long, being the same now worked at Ducktown, Tenn. Here ore was found 5 feet from the surface as rich as that obtained at 200 feet on the famous Comstock lode of Nevada, assaying from $50 to $2,000 per ton, and said to be more advantageously situated than any mine in the West. It will drain itself to a depth of 600 feet, and has a water supply sufficient to operate 10 smelter stacks and all the other machinery necessary. A railroad will be constructed to it from Tilton, a distance of 20 miles. It is said that ore assaying only $4 per ton could be worked with a greater profit than $10 ore in the West. Several large companies have sent their agents to see this mine, and only a few days ago a Pennsylvania company offered Tyler, Gilbert & Rose, the present owners of the mine, $28,000, which was refused.

DEFECTIVE MINING LAWS.—Our mining laws are so framed as to retard the development of the country. The power to make any number of locations, and the holding of the ground for the second year after the location is made, is a drawback that does not seem to be realized by our law makers. The opportunity of relocating ground is an incentive for many men to do nothing upon their claims in the way of development, and they are enabled to hold ground for a term of years without doing a lick of work upon it. In a large number of cases the assessment work, if done at all, is performed upon some part of the claim where there is no ledge and no showing to justify the work being done at that particular place, except it be the fact that the nature of the ground admits of the work being done without much labor and at small cost to the owner. One of the great disadvantages of doing work in this way lies in the fact that such work does not enhance the value of the claim or tend to stimulate mining. If prospectors and miners intend to risk their money and labor in doing assessment work upon mining claims, let the work be done where it will do the most good, and in all cases it should be done upon the ledge, without any regard for the hardness of the rock or the inability of sinking a stated number of feet for $100.—*Tombstone Record.*

ENGINEERING NOTES.

CREEPING OF RAILS.—At the last meeting of the Engineers' Club, held at Washington University, Mr. J. B. Johnson read a paper on the "Creeping of Rails on the St. Louis Bridge." Mr. Johnson said that on the St. Louis bridge proper the rails had been known to creep 200 ft. in one year, and on the bridge approach 400 ft. This creeping varied with the amount of traffic or with the weight carried over the rails. On the St. Louis bridge the rails crept in the direction with traffic. These rails were supported from their base. The reason given by Mr. Johnson for the creeping was that the rail, being held fast on the extended ties, is caused to measure its length across the bridge on its extended flange whenever a heavy weight passing over it caused a wave in the rail. This wave has been known to raise the rail between the two trucks of a car ¾ in., and the creeping has been measured and at times has amounted to ½ in. to ⅞ in. If the rail is supported at one place above its neutral axis, the creeping will be opposite in direction to the traffic. This Mr. Johnson demonstrates satisfactorily with a circular track of hickory. There must be some intermediate point, Mr. Johnson argued, at which the rail would have no desire to creep.

A WONDERFUL ADVANCE IN NAVAL ARCHITECTURE.—Forty-five years ago the Britannia was considered a remarkable ship. She was 207 feet long and her tonnage 1,155. The new Cunarder, the Etruria, is 520 feet long and her tonnage nearly 8,000. The Britannia had engines of 850 horse-power; the horse-power of the Etrurio is 14,000. The Britannia carried 220 tons of cargo and 120 passengers; the Etrurio 5,000 tons of cargo and 1,500 passengers. The Britannia carried 500 tons of coal and her speed was 8½ knots per hour; the Etruria carries 2,500 tons and makes 19 knots per hour. Five years ago the Arizona made the passage in seven days and seven hours. The builder of the Etruria says she will do it in one day less, and in another five years it will be done in five days.

A LIFTING DRAWBRIDGE FOR THE THAMES.—Horace Jones, architect to the corporation of London, has designed a novel bridge to be constructed across the Thames below London Bridge. It will be 880 feet in length, and cost $4,000,000. The waterway will be obstructed by two piers only, leaving a clear way of 200 feet in the center when the draw is open. The piers will be crowned by towers 202 feet in hight, in which will be located machinery for lifting the bed of the bridge to either side for the passing ships and steamers. The two piers are connected by an upper roadway, over which pedestrians can pass when the draw is open, hydraulic lifts being provided for their ascent and descent.

DEFLECTION OF THE MISSISSIPPI.—Captain Eads, who has lately made an inspection of the situation, now declares that within two years the Mississippi is likely to be deflected from its present course past New Orleans down the Atchafalaya directly to the Gulf. Only a tough clay bar across Old River intervenes, and that is being rapidly swept out by the current. The *Times-Democrat* calls earnestly upon Congress to do something immediately to avert the disaster to that metropolis, planting interests of southern Louisiana, as well as the commerce of the great river. That paper asserts that an expenditure of only $12,000 to $15,000 is necessary to obviate the more imminent danger.

STEAM ON LONDON TRAMWAYS.—A satisfactory trial has taken place of one of the fifteen steam tramway locomotives now being constructed by Messrs. Merryweather & Sons, of Greenwich, for the North London tramways. These engines have cylinders 7½ inches diameter by 12 inches stroke, and are each capable of drawing three loaded cars at a speed of eight miles per hour, and at a stated working cost of 30 per cent less than horse power. It is expected that the whole of these engines will be running in the course of the next two months.

HOW SUEZ CANAL IS TO BE WIDENED—PARIS, Dec. 15.—According to the Egyptian correspondent of the *Temps*, the scheme adopted by the Suez Canal Commission for the widening of the canal is shortly as follows: Between Port Said and Ismailia it will be made broad enough to allow of two ships passing each other without stopping. From Ismailia to Suez a canal parallel to the present one will be constructed.—*Special to London Times.*

THE CANAL ACROSS IRELAND, as now projected, and recently submitted, will be 127 miles in length, would contain thirty locks, would be 200 feet wide on the surface, 100 feet wide at the bottom, and would allow the passage of a ship from Galway Bay to Kingston in twenty-four to thirty-six hours. Capt. Eads, proposed to build a ship railway which would reduce the time to twelve hours.

A STREET RAILWAY OPERATED BY WATER.—The cable railway at the Giessbach, in Switzerland, is operated by water. On the arrival of a car at the upper station, it is weighted with a sufficient quantity of water from a reservoir, supplied by a spring, to draw up the other car; so that each car alternately acts as a motor at a very small cost.

USEFUL INFORMATION.

Man's Progress Through the Ages.

Geologists, ethnologists, scientists, savants, and learned men of all lands, have had a great deal to say of the different "ages" through which man has passed. For instance, they tell us that we have come down to the present day through the cave-dwelling age, the mound-building age, the stone age, the bronze age, the iron age, to say nothing of the lake-dwelling age, clay-eating age; that finally letters were invented, and then man took a big jump, made parchment, devised ink and pens, and became a gentleman, turning his back forever on mud and acorns as a steady diet, and ignoring holes scooped out of the ground as places of residence. But he had still another step to take before he reached the crowning age of all, to wit:

The Paper Age.

It was necessary for him to learn to transform rags into paper. This he accomplished about 900 A. D., and from that brilliant stroke of human genius we date the Paper Age. Since then all has been easy enough. Books took the lead, newspapers followed, periodicals, magazines and trade journals closed the triumphant march toward complete happiness. Scientists—always short-sighted folk—began to look upon the "Paper Age" as nearing its close. Poor souls! Paper bags and paper boxes made them smile; paper boats, paper barrels and and paper wheels gave them a chill in the dorsal region; paper collars and paper handkerchiefs set them hemming and hawing; paper bottles, paper tea-caddies and paper chimneys created quite a flutter in so-called "scientific circles;" paper timber and paper flooring rendered them rather uneasy; paper shirt fronts and paper slippers broke them down entirely. But the end is not yet. We are in reality only just entering upon the borders, so to speak, of the genuine Paper Age. In a few short years, in our paper shirts and paper trousers, we shall sit down to our paper table upon our paper chairs, drink our coffee out of paper cups, and eat our eggs with paper spoons. When we go out of a morning we shall make ready our paper shoes, paper overcoat, paper gloves, paper umbrella, or paper cane, and paper hat, kiss the baby happy in its paper pinafore, trip lightly down the paper stairway, over the paper sidewalk to our paper carriage, and start down town, stopping at the club for an "eye-opener" out of a paper wine cup, and then continue our noiseless ride over the paper pavement, stopping once more possibly to order the latest paper novelty for our better-half. Oh no, ye wise men, the end of the Paper Age is not yet!—*The Paper World.*

Ammonia Cheaper than Soap.

Ammonia is cheaper than soap and cleans everything it touches. A few drops in a kettle that is hard to clean makes grease and stickiness fade away, and robs the work of all its terrors. Let it stand ten minutes before attempting to scrape off, and every corner will be clean. It cleans the sink and penetrates into the drain-pipe. Spots, finger marks on paint disappear under its magical influence, and is equally effective on floor and oilcloth, though it must be used with great care on the latter or it will injure the polish. There is nothing to equal it in cleaning the silverware, and it gives a higher polish and keeps clean longer than anything else. If the silver be only slightly tarnished put two tablespoonfuls of ammonia into a quart of hot water, brush the tarnished articles with it and dry with a chamois. If badly discolored, they may need a little whiting previous to the washing. An old nail brush goes into the cracks to polish and brighten. For fine muslin or delicate lace it is invaluable, as it cleans without rubbing the finest fabrics. Put a few drops into your sponge, bathe in hot weather, and you will be astonished at the result, as it imparts coolness to the skin. Use it to clean hair-brushes, and to wash any hair or feathers to be used for beds or pillows. When employed in anything that is not especially soiled, use the waste water afterward for the house plants that are taken down from their usual position and immersed in the tub of water. Ammonia is a fertilizer, and helps to keep healthy the plant it nourishes. In every way, in fact, ammonia is the housekeeper's friend.

WHITE LABEL PAINT.—A white varnish or paint for painting labels upon glass, wood, or metal, known in Germany as *Cracau's Shilderlack* (Cracau's Label-varnish) is prepared in the following manner: Triturate 150 parts of best zinc white and 3 parts of finely powdered acetate of lead in a warm mortar with a little oil of turpentine, to a uniform mass of consistence of lard; then add gradually, under constant stirring, 20 parts of boiling (not "boiled") linseed oil. Though the resulting mixture has a very dark color, this does not interfere with the uses of the varnish, as it will produce a perfectly white surface. Next, 90 parts of damar varnish (made from 1 part of damar and 2 parts of oil of turpentine), 5 parts of castor oil, and lastly 20 part of copaiba are added, the whole well mixed, and finally diluted with about 100 parts of oil of turpentine. The varnish is transferred to a cylindrical vessel, and set aside for about one week. During this time any coarse grains of zinc white will settle to the bottom. The supernatant liquid and a portion of the sediment (about three-fourths; all but the coarse portion) are poured out, and the varnish or paint is ready for use.—*Pharm Handelsbl.*

CRYSTALLINE COATING FOR WOOD OR PAPER.—Mix a very concentrated solution of salt with dextrin, and lay the thinnest possible coating of the fluid on the surface to be covered by means of a broad, soft brush. After drying, the surface has a beautiful, bright, mother-of-pearl coating, which, in consequence of the dextrin, adheres firmly to paper and wood. The coating may be made adhesive to glass by doing it over with an alcoholic shellac solution. The following salts are mentioned as adapted to produce the most crystalline coating, viz.: Sulphate of magnesia, acetate of soda, and sulphate of tin. Paper must first be sized, otherwise it will absorb the liquid and prevent the formation of crystals. Colored glass thus prepared gives a good effect by transmitted light.

TO CLEAN VARNISH.—Save the tea leaves for a few days, then steep them in a tin pail or pan for half an hour, strain in a sieve and use the tea for all varnished paint. It requires very little elbow polish, as the tea acts as a strong detergent, cleaning the paint from all impurities, and making the varnish equal to new. It cleans window sashes and oil-cloths—indeed any varnished surface is improved by its application. It washes window panes and mirrors much better than water, and is excellent for cleansing black walnut picture and looking-glass frames. It will not do to wash unvarnished paint with it.

FILLING FOR CRACKS.—A very complete filling for open cracks in floors may be made by thoroughly soaking newspapers in paste made of one pound of flour, three quarts of water, and a tablespoonful of alum, thoroughly boiled and mixed. Make the final mixture about as thick as putty, and it will harden like papier mache.

TO MEND CHINA or broken earthenware, take a very thin solution of gum arabic in water and stir into it plaster of Paris until the mixture becomes of the consistency of cream. Apply with a brush to the broken edges of the ware and join together.

GOOD HEALTH.

The Healthfulness of Eating Before Sleeping.

David M. Stone has an interesting article in the Boston *Journal of Commerce* on this subject, from which we quote as follows:

The notion is widely prevalent that it is unhealthy to eat late at night or just before retiring. This came from the severe denunciation of "late suppers" contained in nearly all the works on diet. But it was the midnight debauch that was the object of attack, and even here it was less the gluttony than the drunkenness which alarms the doctors and calls forth their reprehensions. A man may induce apoplexy by gorging himself with food at any hour of the day. Man is the only animal that can be taught to sleep quietly on an empty stomach. The brute creation resent all efforts to coax them to such a violation of the laws of nature. The lion roars in the forest until he has found his prey. The horse will paw all night in the stable, and the pig in the pen, refusing all rest or sleep until they are fed. The animals which chew the cud have their own provision for a late meal just before dropping off to their night slumber.

Man can train himself to the habit of sleeping without a preceding meal, but only after long years of practice. As he comes into the world nature is too strong for him, and he must be fed before he will sleep. A child's stomach is small, and when perfectly filled, if no sickness disturbs it, sleep follows naturally and inevitably. As digestion goes on the stomach begins to empty. A single fold in it will make the little sleeper restless; two will awaken it, and if it is hushed again to repose the nap is short, and three folds put an end to the slumber. Paregoric or other narcotic may close its eyes again, but without other food or some stupefying drug it will not sleep, no matter how healthy it may be. Not even an angel who learned the art of minstrelsy in a celestial choir can sing a babe to sleep on an empty stomach. It is a fact established beyond the possibility of contradiction that sleep aids digestion, and that the process of digestion is conducive to refreshing sleep. It needs no argument to convince us of this natural relation. The drowsiness which always follows a well-ordered meal is itself a testimony of nature to this interdependence. The waste of human life by the neglect of the lesson is very great. The daily wear and tear of the body might be restored more fully than it usually is, if this simple rule was not systematically violated.

BRIGHT'S DISEASE.—Few, I think, are aware of the extent of this disease, of the number of persons who annually die with this malady. I do not wish to run this into a "patent medicine" advertisement, nor will I put Dr. or M. D. to my name, but wish to merely give a few points that may benefit those who may read this. The symptoms of Bright's disease are many, and will develop in almost any part of the body but the kidneys, where usually no pain is felt, and one would not suppose that anything was wrong with their kidneys. One of the most reliable proofs (unless it be with the aid of the microscope) is the following: Take a clean bottle; holding about a pint, fill it with urine and place it in a water bath, i. e., put it in a dish of warm water and bring it to a boil, boiling for one-half hour. If at the end of that time the urine has turned milky, become thickened and somewhat resembling sour milk, you have certainly Bright's disease. I have no pecuniary interest in any of the so-called patent medicines, but whenever we find that they contain the articles that are needed to cure the disease, why not use them? Tramer's Safe Cure, I am sure, will cure this disease if taken in time. Dr. G. Johnson, in an address delivered before the British Medical Association, stated that a patient of his who was 55 years of age, who has lived on a milk diet for five years, took a gallon of milk a day, but not a particle of any other food. This treatment entirely cured him of Bright's disease. T T

Jan. 1, 1885.

Increased Duration of Life.

The stage, in the duration of life to which we have at present attained, may be stated thus: Compared with the period 1838–1854 (the earliest for which there are trustworthy records), the average of a man's life is now 41.9 years instead of 39.9, and of a woman's, 45.3 instead of 41.9 years, an addition of eight per cent to the female life and five per cent to the male. Of each thousand males born at the present day, 44 more will attain the age of 35 than used to be the case previous to 1871. For the whole of life the estimate now is that of 1,000 persons (one-half males and one-half females) 35 survive at the age of 15, 26 at 55, 9 at 65, 3 at 75, and 1 at 85. To put the case in another way, every thousand persons born since 1870 will live about 2,700 years longer than before. In other words, the life of a thousand persons is now equal in duration to that of 1,070 persons previously; and 1,000 births will now keep up the growth of our population as well as 1,070 births used to do. This is equivalent in result to an increase of our population, and in the best form, viz: Not by more births, but by fewer deaths, which means fewer maladies and better health. What is more, nearly 70 per cent of this increase of life takes place (or is lived) in the "useful period," namely, between the ages of 20 and 60. Thus, of the 2,700 additional years lived by each thousand of our population, 70 per cent, or 1,890 years, will be a direct addition to the working power of our people. It is to be remembered that there might be a great addition to the births in a country, with little addition to the national working power—nay, with an actual reduction of the national wealth and prosperity—seeing that, regarded as "economic agents," children are simply a source of expense, and so also are a majority of the elderly, who have passed the age of threescore. On the other hand, as already said, only one quarter of the longer or additional life now enjoyed by our people, is passed in the useless periods of childhood and old age, and more than one-third of it is lived at ages when life is in its highest vigor, and most productive alike of wealth and enjoyment.—*Cornhill Magazine.*

INJURIOUS TO VISION. Railroad traveling is said to be injurious to vision on account of the vibrations, which makes print dance before the eyes, and induces such intent observation as to produce fatigue. It is curious to note the eyes of one's fellow travelers who are looking out of the window during a rapid railway journey. The ever-changing landscape induces an oscillation of the visual organs so incessant and continuous as to be perfectly astonishing. The effect of this exaggerated activity and restlessness may be, perhaps, more fatiguing than the steady perusal of well printed type. It is curious to note how some eyes engaged in looking upon this constantly shifting scene and have momentary pauses in their labor, become motionless, as if staring into vacuity, nature thus snatching a few seconds of much needed rest, both for brain and eyes.

MALARIA.—The latest theory of malaria is that the principal source of the fever and exhaustion is to be sought in the slowly but cumulatively poisonous influence of the relatively large amount of carbonic acid in the atmosphere of malarious districts, generated by vegetable decay, by evaporation of soil moisture laden with it, or by upturning of earth saturated with that compound. Recent measurements of the carbonic acid in the soil, as compared with the amount present in normal atmosphere, have shown that their relative proportions are as 250 to 1.

INGROWING TOE-NAILS.—EDITORS PRESS:—Having seen a notice in a recent number of the PRESS for treating ingrowing toe-nails, please allow me to state a process which I have known to succeed in numerous cases: First, never cut an ingrowing nail, or any other, too close to the flesh. Second, take a little cotton or scrape some lint from an old rag and with the point of your pocket knife press it under so as to raise the nail from the tender flesh. This is a very simple process, but I believe it is not generally known, and I have never seen it fail of accomplishing the purpose. B. B. R.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA

Amador.

MISCELLANEOUS.—*Ledger*, Jan. 26: The Plymouth Con., on the 9th inst., declared its twentieth monthly dividend of 50 cents per share, aggregating $50,000. S. D. R. Stewart keeps 20 stamps of the Lincoln mill running steadily. The rock is soft, and 50 tons per day is easily disposed of. The ore is of low-grade, but leaves a small margin of profit over expenses. The new hoisting works of the South Spring Hill are expected to be in running order some time next week. The mill is kept running to its full capacity. A. M. Randall has leased on shares the gravel claim of A. P. Clough, located within the limits of his garden near Volcano. Hydraulicing was started a few days ago, and some excellent pay dirt was encountered. The lessee is to divide the net proceeds with the owner. J. T. Wheeler's gravel claim at Pine Grove is in full blast again. The first heavy rains caused a bad landslide, which has taken several weeks to overcome. They started washing again Tuesday morning. At the Tellurium the rock on the dump at the time of the fire has been crushed, under the supervision of L. McLaine. It is currently reported that in case the ore yielded an average of $8 per ton, there were parties in Jackson ready to take hold of the property. The cleanup it is said, exceeded expectations, but the exact yield we are not in a position to give. Seven men are at work on the New York quartz mine, located in John Bull gulch, three miles southwest of Jackson. They are sinking a shaft from the tunnel level, which is 70 feet from the surface. There is a large body of low-grade ore, which it is thought will pay if properly treated. The old ditch is being cleaned out, and a furnace will be erected on the ground. The big tunnel at Middle Bar is again in rock of the hardest character.

SUTTER CREEK.—The break in the pump at the Mahoney has been repaired, and has been running satisfactorily for nearly a week. Unless some further mishap occurs, they expect to get the water out in about a week. The pump rod at the Lincoln broke a few days ago, causing a large increase in the water at the Mahoney. A number of men are at work putting in nearly 60 feet of rod. At the same time the shaft will be repaired to some extent.

THE MINING OUTLOOK.—Amador *Dispatch*, Jan. 24: The mines located south of Jackson, near the Mokelumne river, all seem to have taken a fresh boom lately. In addition to the celebrated Nevills mine we learn that rich strikes have been made within the last few days in the Morgan mine, the St. Julien mine, and also the mine owned by John Wetzler & Co. The latter mine, especially, we understand is yielding a fabulous amount of gold every day.

Inyo.

KEYNOT MINE.—Inyo *Independent*, Jan. 24: The proprietor of the Keynot mine, Beveridge district, Mr. L. L. Lasky of Lone Pine, says he wants to push the development of that property with all possible vigor. On the entire claim there are now nine separate openings or mines, and in these Mr. Lasky says 41 men are now at work on the tribute system. He says further a large number of miners could all be put to work on the claim with assurance of making good wages, and he will furnish food, tools and all necessary supplies to good miners, they to pay for the goods out of the proceeds of their labor in the mines. There is a good mill on the claim where ores are worked as fast as mined. A new prospect mill was also completed last week, that will work samples of 50 pounds weight and upward. A road was opened to the mine last week, and Mr. Lasky says he sent over it three and a half tons of groceries and provisions. Tom Bastian and his brother and three other partners are running an air tunnel to an ore chute out of which several hundred tons of ore have been taken that averaged about $100 per ton. The quantity of ore still in this chute is known to be very large, and when the air tunnel shall be finished, and about 100 feet remains to be completed, this ore body will yield large returns to tributers and proprietors. All these statements are made by Mr. Lasky himself, and so far as propositions to miners are concerned, he says he is ready at any time to carry out all that is promised.

ALABAMA HILL.—For several years past a little mining has been done occasionally on rich ground in Alabama Hills, near Lone Pine. The great scarcity of water made the operations very limited, however. Mr. S. Zaun, who owns the principal claim, has lately completely a ditch extending from the main range of the Sierra on to the mining ground. This ditch will supply an abundance of water during about eight months of each year. Mr. Zaun has been very much hindered by want of money to carry on vigorously the work of making this ditch. Patience has at last succeeded, as it rarely fails to do, and now there is a fair prospect of being rewarded for all the time and labor spent.

A NEW TUNNEL.—Last Monday A. C. Harvey and Rube Speer began work on a tunnel to open a mine about one and a half miles from Lone Pine station on the C. & C. railroad. The ledge was first found near the top of a high cliff; here enough work was done to determine the width and direction and the quality of the ore. The tunnel will not have to be run far to strike the ledge, and will give a good depth of backs.

ORE SHIPMENT.—A quantity of ore is now ready for shipment at the Eclipse mine. It will be sent to Selby & Co., San Francisco, and is fine smelting ore.

Nevada.

MUNDIC.—Nevada *Herald*, Jan. 24: At the Wyoming mine a few days since, a nest of what miners call mundic, was discovered. The deposit was not very large, being a portion of that which was taken out some time ago while running a drift. Many pretty specimens were found, of almost solid sulphurets and pyrites, showing the same in a variety of shapes and colors. Some of the pieces sparkle like precious gems. Foreman Peard has our thanks for several specimens.

BULLION.—Foothill *Tidings*, Jan. 24: The Cornucopia and Secret Treasure Mining Company, of Washington township, has made its first shipment of bullion. The ore mills a little $20 to the ton, and $10 a ton will give good profit. The name of the company is too long.

WILLOW VALLEY DISTRICT.—Nevada *Herald*, Jan. 24: Commencing at the upper or eastern end of this district, 4 miles, from Nevada, we first encountered the Federal Loan and Constitution mines parellel locations some 600 ft apart.

FEDERAL LOAN.—This is one of the oldest locations in the disttict, and is situated on the south bank of Deer creek. Country rock, metamorphic slate; course east and west; dip 32 degrees south; size of ledge from a few inches to 4 ft. The mine has been worked in the past to a depth of 100 ft by an incline. Results generally satisfactory, some very rich spots being met with. Present operation have been confined to the sinking of the above incline, which has reached the depth of 180 ft. The late storm caused the breaking in of a neighboring ravine into the mine. This unlooked for event has necessitated running a tunnel some 200 ft in length, to draw the water into a different channel. A night and day shift are engaged in pushing this tunnel rapidly to completion. The hoisting and pumping rig is run by a three-foot hurdy wheel, under a 120-ft pressure. A 10-horse power engine is also a part of the plant and can be attached in short order in case of breakage. A six-inch pump keeps the mine free from water under ordinary circumstances. This mine is well located for economical and profitable working, being situated below and contiguous to the V Flume Lumber Co.'s flume, and also 900 feet distant from the South Yuba Canal Co.'s ditch, from which a pressure of 400 ft can be obtained at the works by a comparatively small out-lay. Operations are being conducted by Wm. Avery, Esq., for Eastern parties.

CONSTITUTION MINE.—This mine, located in the fifties and worked with varying success at different times since, bids fair to become one of the valuable mining properties of this district. The mine has the reputation of being one of the richest sulphuret ledges in the county. The ledge varies in size from 6 inches to 2 ft. Considerable work seems to have been done. The mine is comparatively undeveloped, operations having reached but a short distance below water level, which is the bed of the creek. The facilities for working are equal, if not superior, to any in the county, it being situated almost equi-distant from the South Yuba and Snow Mountain ditches, insuring on either side water power with pressure of hundreds of feet. The present operations are confined to sinking a new shaft about 200 ft south of and across the creek from the old shaft. The ore which has been extracted is very heavily sulphureted and is as fine rock as has been brought to the surface in the district for some time. Like all heavy sulphuret ledges, it has been compelled to lie idle for want of proper facilities, the quartz carrying but little free gold. Rock in former times, although assaying hundreds of dollars per ton, barely paid expenses. In these times, with cheap facilities for extracting and Frue concentrators to save sulphurets, we know of no reason why mines of this character can not be made to yield handsome returns. Maltman, Myers & Co. are the owners.

LECOMPTON.—The Lecompton ledge was located in the spring of 1857, by Geo. Hearst, Geo. D. Roberts and others, and is situated about three miles from Nevada. Over $60,000 clear was taken out in the first year's working. J. J. Ott, of this city, purchased the property in 1893. Up to this time the gross yield was over $220,000, the rock averaging $40 per ton. Ott erected pumping and hoisting machinery on the south bank of Deer creek and sunk an incline to the depth of 175 ft, taking out considerable rock. The ledge varies in thickness from 3 inches to 2½ ft. The high water of 1864 damaged the plant, besides filling up the incline with water. Operations have not been resumed at this point to date. Desultory prospecting has been carried on above the water level, from which some very satisfactory results have been obtained, some of the latest crushings averaging as high as $150 per ton. This mine has equal facilities with those above mentioned for ample and inexpensive power. Country rock, granite; one-half mile east of this mine is the contact of the granite and slate.

RISING SUN.—The Rising Sun, or John Day ledge, is about two miles from Nevada, a short distance above the Oriental mill. Working in the past have been confined mostly above water line. The present lessees have erected neat and compact hoisting and pumping machinery, (propelled by a hurdy wheel under 300 ft pressure), and sunk an incline on the ledge. The late storm caused a greater flow of water than their 8-inch pump could handle and the mine became filled. A 10-inch pump has been put in place and is rapidly clearing the works of water. Trenberth, Hampton & Co. are the managers of this enterprise. Country rock, granite.

DEADWOOD.—Little or nothing is being done at this mine at present. The ledge is in granite and runs north and south, dipping west at an angle of 45 degrees. Some excellent rock was taken from it a few years ago.

NEVERSWEAT.—A ledge of fine sulphuret rock, for which the owners have been offered $200 per ton on the dump, was struck a short time ago. This is an east and west ledge, pitching north, and is worked through an incline. Substantial hoisting works and pumping outfit, propelled by water power, facilitate operations. Lyons, Hampton & Co. are the owners.

HUSSEY MINE.—This is considered by judges to be a good mine, but has been closed down temporarily. The mine is provided with complete hoisting works, the same being run by a 22-ft overshot water wheel.

MONTANA.—An old location which has yielded well in the past, but which has been worked very irregularly for several years. The course of the ledge is east and west, dipping to the north at an angle of 32 degrees. It has been worked to a depth of 300-ft. There are steam power hoisting works.

RICH MINING STRIKE.—Nevada *Herald*, Jan. 24: A streak of unusually rich rock was struck in the bottom of the shaft at the Nevada City mine yesterday, 800 feet from the surface. The quartz is literary filled with gold and is about the richest rock yet discovered in this mine, which is celebrated as a producer of valuable specimens. One box of selected quartz, valued at $2,500, was shipped below, to be sold to the jewelry manufacturers. Another box has been put aside to await orders from San Francisco jewelers. Considerable of rock was thrown into the batteries. It is estimated that the ore already extracted from this rich bunch or pocket, is worth between $3,000 and $4,000. Some of the specimens would go as high as $200,000 per ton.

Plumas.

FOREST KING.—Greenville *Bulletin*, Jan. 24: The owners have been running a tunnel 150 ft below that from which the pay ore was taken last fall. They are running along the side of ledge matter and are within 100 ft of the pay chimney worked previously.

NORTH FORK.—John Ellis, the veteran prospector has returned from a trip to the North Fork country. Ballou & Winters are running a tunnel on their gravel claim and have good prospects of reaching the channel soon. R. C. White & Co. are pushing their tunnel ahead with favorable indications. At Drummond's Point, near Cariboo, three men took out $900 in one day by drifting in a quartz crevice. B. Pazzonia is at Dutch Hill has his tunnel in 700 ft. In seeking the ledge, he crossed a bed of lava 300 ft wide, and the indications are that he will soon break into a channel. His quartz mill is now idle in consequence of cold weather.

LEASED.—E. Ware & Co. have leased the Sunnyside mine from R. L. Hobart. Ore is now being hauled from the Ano mine to the Arcadian mill. Crushing will begin in a day or two. Ellis & Davis will open up what is known as the Abbott tunnel on an extension of the Drury mine near the Forest King. Mr. Ellis informs us that work will begin at once.

Sacramento.

MINES AROUND FOLSOM.—*Telegraph*, Jan. 24: To the casual observer, Folsom does not bear the appearance of a mining town. The days when gold dust circulated as a medium of exchange in the everyday business transactions of buying and selling flour, potatoes, bacon and rubber boots, have long since departed. No longer does the red-shirted miner ride into town on his mustang, with his trouser legs stuffed into his boot tops, a sombrero on his head and a clay pipe in his mouth. Nevertheless our mining days are not gone. Scores of miners are delving away with pick and shovel in this vicinity. Being invited to take a look at some of the claims now being worked in the vicinity of Alder creek, one day this week the writer boarded the noon train for Sacramento and prepared for an afternoon among the gold hunters. Arrived at the creek, which is about three miles distant from Folsom, we proceeded to Mr. Farmer's claim, where we discovered his partner, Charlie Imhoff, busily engaged in running a drift. The mine is situated about 200 yards from the railroad, and is a gravel bank about 12 ft in depth. The gravel is very closely packed, and is exceedingly hard to get out. The gravel is wheeled a short distance to a string of sluices, where it is easily washed. So far, this claim prospects very well, and will undoubtedly pay. A large number of Chinamen with rockers are working here and there among the gravel banks, and appear to be making wages. In this connection we may add that it is a fact to be regretted that many of the very best and largest claims in this neighborhood are owned and worked by Chinese.

San Bernardino.

BISMARCK CAMP.—Calico *Print*, Jan. 25: The shaft on the Bismarck is now down 100 ft and shows a paying ledge nine ft wide. It is in contemplation by the owners to increase their working force by 30 men in a few days, and as little of the work done will be dead work, a largely increased bullion production is confidently expected from this mine. The Exchequer, in the vicinity of the Bismarck, Oriental, Humbug, etc., is showing up large bodies of ore milling over 100 ounces per ton. Work has been suspended for a few days, but will be resumed again shortly with an additional force, and Mr. Brison anticipates being able to demonstrate that he has a mine not second to any of those in the vicinity above named, although everyone of them is now looking better and more promising than at any time since work upon them commenced. There are already over 100 work-men employed in this "ward" of East Calico, and quite a village is springing up, already comprising some twenty-five houses. There are two good hotels there, a store doing a profitable business, and a large saloon is now in course of construction.

LITIGATION.—There is a likelihood of some interesting litigation over the boundaries of some of the Calico mines since their value has been demonstrated by development. Several lawsuits are on the tapis.

ORES.—Several of the chloriders in East Calico are sending their ores to the Waterman mill for reduction. There is a large increase of the number of men at work in that section, as well as of production, and there will be urgent demand for additional milling facilities shortly.

THE tunnel at the foot of the falls on the Sue mine, which has been steadily pushed ahead on two wings, during the past two months, is now in 220 ft on one course and has struck a body of good ore. This tunnel is not less than 1000 ft below the main shaft on the apex of the mountain, which is over 125 ft deep in first-class ore, and there are surface indications where ore has been taken out the whole 1500 ft length of the ledge.

Sierra.

WORK PROGRESSING.—Sierra *Tribune*, Jan. 24: At the Young America mine the work of development goes on with the most encouraging prospects. The low tunnel is in 220 ft, 80, of that distance being on the ledge. The tunnel is still some 60 ft from the shaft where the first prospecting was done. The The average width of the point upon which it is worked at present, better prospects are obtained than at any place previously open out on it. A *Tribune* reporter on Tuesday saw a piece of rock that was taken from the hanging wall of the ledge. The chunk did not weigh over one pound and upon being up in a mortar and "panned" out, yielded a trifle over one dollar in gold. It is the opinion of everybody here who is acquainted with the Young America that it will develop into one of the biggest mines ever opened out in this section.

RUBY MINE.—Encouraging reports come from the Ruby mine. The working force has lately been increased to 30 men, and this number will be added to, as developments are made. The gravel being taken out yielding handsomely. The course of the channel is north. Last week a tunnel was started running west of the present tunnel to prospect for the continuation of the Bald Mountain lead.

Tuolumne.

NOTES.—*Union Democrat*, Jan. 24: C. W. Tozer has bonded the Eagle mine at Blue Gulch, near Jacksonville, and has commenced work to develop the property. The Eagle mine is situated on the mother lode, and is considered by mining men to be a promising property. At the Buchanan operations are being steadily pushed. Over 400 tons of ore lies on the dump ready for crushing, all of it taken out in the necessary work of development. No stopes have been opened as yet. It now seems settled that a mill will be erected in the spring. Operations have been suspended at the Dead Horse mine until the roads get into good condition for hauling. The machinery for the new works is on the ground, but the lumber is lacking. The mine is said to present an exceedingly flattering appearance. W. E. Koch has bonded the Hunter mine, above Summerville, and will take charge of it on the first inst. It is reported that Mr. Leechman of the Soulsby mine will direct operations. Billy Reddy has nearly completed the tunnel into Bonanza Hill. He expects to get into the old workings of the Bonanza mine in a few more days. The pocket miners on Bald Mountain are very busy. Several good pockets have been taken out lately, which of course stimulates exertions. A contract to sink the shaft of the Lamphier mine fifty ft deeper has lately been let. Prospecting in the drifts still continues. Lang & Shaw have hauled the Golden Gate mill over to Groveland, and are going ahead with the work of erection. The Soulsby mine and mill are being steadily operated, and the ore extracted is of very good quality. Long & Hampton are keeping things going at the Williaetta mine, and making regular clean-ups.

NEVADA.

Washoe District.

GOULD AND CURRY.—All work below the Sutro tunnel level has been discontinued, and the tracks, air pipe and the like hoisted out. They are now cutting out a joint station on the 1000 level of the Gould and Curry or Bonner shaft. When completed the Gould and Curry will run a north lateral drift to the Best and Belcher south line, when the latter will continue it through its own ground.

OPHIR.—The water is fast draining out from the old Mexican shaft and the surrounding ground on the 500 level. The north lateral drift on the 500 level is being advanced as rapidly as possible. It is being run along the west wall, and will be continued through the Mexican and Union Con. ground. From the 250 level have shipped to the Morgan mill, from November 26 to January 16, inclusive, 876 tons and 746 pounds of ore, which is now being milled.

HALE AND NORCROSS.—The west cross-cut (No. 2) on the 2800 level is still being advanced in solid quartz, which is metal-bearing and of a most promising appearance in every respect. It is expected that the ore streak found in No. 1 cross-cut will soon be encountered. A drift is now being run from the Chollar main west drift on the 3000 level to connect with the bottom of the main winze. As soon as this connection has been made all will be open to exploration from the 3000 level to the surface.

BEST AND BELCHER.—A bulkhead has been put in at the Osbiston shaft and the pumps stopped. Thus the water is being allowed to plow through of itself into the Sutro tunnel. The track, pipes and other apparatus below the Sutro tunnel level have all been hoisted up.

COMBINATION SHAFT.—The new hydraulic pump on the 3000 level is now running very smoothly and well, thoroughly doing all the work required of it. The main west drift on the 3000 level of the Chollar has been stopped, and a branch drift started directly toward the bottom of the Hale and Norcross winze.

SAVAGE.—The E-street tunnel is now passing through the old stopes, but has not yet reached the point where it is expected that ore will be found.

YELLOW JACKET.—The old upper levels continue to yield a considerable amount of low-grade ore, which is being sent to the mills on the Carson for reduction. Much ore has been opened up ready for extraction, and explorations are still continued at various points.

SIERRA NEVADA.—The mine has been dismanteled below the Sutro tunnel level. Preliminary operations have been commenced on the Cedar Hill in the old Sacramento ground, and eventually work will be started at other points in the same locality.

CROWN POINT.—The usual amount of low-grade ore is being extracted and sent to the mills on the Carson river. A considerable amount of prospecting is being done at various points.

CON. CALIFORNIA AND VIRGINIA.—Good progress is being made in the work of repairing the main drift on the 1550 level, and some preparatory work is being done at other points in the old workings.

MEXICAN.—A drift is being run north from the Ophir, on the 500 level, to prospect the mine at that depth.

BELCHER.—A considerable amount of low-grade ore is still being extracted and shipped to the mills. A good deal of ore that will pay for working is still in sight.

UNION CON.—A drift is being run north from the Ophir on the 500 level which will open up a large area of ground hitherto unexplored.

Cortez District.

LOOKING BRIGHT.—Eureka *Sentinel*, Jan. 20: We are permitted to print the following interesting extract of a letter from H. J. Smith to a citizen of Eureka, concerning his mine in Cortez: "I am happy to inform you that things are looking exceedingly bright in the mine I am working. We have a foot of splendid ore in the lower tunnel, and alongside of it is a large ledge spotted with good ore. This is at a vertical depth of 200 ft. We have passed through a nice body of ore in the upper tunnel, which is at a vertical depth of 150 ft, and we believe we are within 30 ft of another body in this tunnel. All the boys on the hill are doing well."

Dun Glen District.

GOLD.—Reno *Gazette*, Jan. 20: G. McM. Ross has taken up a little gold mine at Dun Glen, Humboldt county, that only runs from $6 to $10 per ton,

and is making $3,000 a month from it. He has a ten-stamp mill and two Frue concentrators. He burns sagebrush for fuel. He has plenty of ore in sight to run for ten years, and there are other mines just as good all around. Mr. Ross thinks the country from the Humboldt House to the Carson Lake is the best mining country in the world.

Eureka District.

LORD BYRON MINE.—Eureka *Sentinel*, Jan. 20: Reuben Rickard, Esq., general manager of the Dunderberg Mining Company, will leave on Friday morning next for London via Denver. To a *Sentinel* reporter yesterday, he stated that a site has been decided on for a new shaft in the Lord Byron mine, and the work will be commenced at an early day. Mr. Rickard has great confidence in the future of Eureka district, and especially in some of the properties belonging to the company he represents.

ADAM'S HILL.—There is considerable activity among the mining men on Adam's Hill. But few if any idle miners are there, and all those working are doing well. The Oriental and Belmont mine, which is worked by Messrs. Ball and Poplin, is shipping about 25 tons of ore every week to the Richmond furnaces, which range in value from $20 to $140 a ton. Its ledge is 50 ft wide, has well-defined walls, and promises to improve in value as greater depth is attained. It is joined on the west by the Mimbres mine, another very promising piece of property, the ledge of which has been crosscut a distance of 50 ft, and already ore to the value of nearly $20,000 has been extracted from it and worked. It is an immense mass of mineral, and its width has not yet been ascertained. The east wall is lime, the west wall shale, and on the east side of the lime, between it and the Oriental and the Belmont ground, is a belt of splendid looking quartzite. From 10 to 15 tons of ore, valued at from $20 to $125 per ton, is shipped weekly to the Richmond furnaces. The Altoona is owned by Messrs. Molino and Frazer, and every week shipments of good ore are made. The Reserve mine owned by Whittenburg and Hamilton, is also shipping ore. The Silver Lick is leased by some Cornish boys, who are extracting ore and doing well. The Marguerita is owned by J. Haines and others, but it is now leased to parties who are making shipments of splendid ore every now and then. Some French Boys secured a good lease recently, and they are said to be doing well.

ORE SHIPMENTS.—*Sentinel*, Jan. 24: The shipments of ore to the Richmond furnaces the past week have not been very large, but they have been almost as numerous as usual. Among the mines shipping from Prospect Mountain were the Lord Byron, Tiger Lily, Excelsior, War Eagle and Tiger. The following Adams Hill mines also made shipments: Herculean, Oriental and Belmont and Macon City. The following companies shipped their ores to the Eureka furnaces as follows: Summit, 7 tons; Silver Connor, 22½; Bowman, 33½; Altoona, 11.

Newark District.

AT WORK.—Eureka *Sentinel*, Jan. 24: Some 20 men in all are working in the several mines about Newark. The Bay State and Battery properties are making regular shipments of ore that pay a handsome profit. Recently a good strike was made in the Poor Man mine, and a shipment of $155 ore was made from it last Monday. The Bay State men talk of constructing a furnace in the spring—the leaching process—as they have plenty of good ore in sight, and they will thereby save the cost of shipping it to the furnaces here. Everyone there is hopeful, and work is progressing favorably in the mines that are being worked.

Pyramid District.

A SYSTEMATIC PLAN.—Reno *Gazette*, Jan. 26: Those who have watched Pyramid camp the closest feel that the time has come when the mystery is to be solved, if it has not already been done. A systematic plan of prospecting has been made out, and it will be followed, no matter what occurs. The company has put David Monroe Tyrrel in charge of mine as superintendent—a man who has had many years of experence on the Comstock, at White Pine, Aurora and elsewhere. J. H. Kinkead is general manager. The water jacket furnace is being set up by Thomas and Hughes, of Virginia City—both thorough workmen. Mr. Thomas is night foreman in the Belcher mine. The work of prospecting has been begun on three levels, 14 men being now employed. They are all in the front ledge, the back one remaining unopened as yet. On the tunnel level, 550 feet from the top, drifts have been started both ways on the ledge. They are not through the old ground yet, and are so far simply old works cleaned out and newly timbered. On the 500-foot level a drift has been started northwest, along the ledge, and it is in 50 feet. It has the rich black ore in abundance. It comes in at a point and widens out, and then goes out at the side or pinches out again. The bunches run all the way from one to eight or ten feet wide and eight to ten feet in length. The whole drift is in ore but of a lower grade. A cross-cut run shows the ledge to be ten feet wide. These ore bunches heavy with iron in it also. On the 370-foot level a drift has been started along the ledge to the northwest also. It is 60 feet into the old workings. Ore is being stoped out from the winze connecting the end of the tunnel and the bottom of the shaft. The men began at the 500 level and are working up towards the 400; there is good ore all the way. Mr. Tyrrell says, the fact is, very little is known of the mine. The shaft went down in good ore most of the way, and the upraise from the tunnel also, but no prospecting has been done that got far out into the mine. The work has all been done close around the upraise. It will be the first business of the company to get out into the dark corners and see what the ledge holds.

Rebel Creek District.

ORE SHIPMENT.—*Silver State*, Jan. 24: Ore to the amount of 22,000 pounds, from the Ohio mine, at Rebel Creek, was shipped from this station Thursday, to Salt Lake City, for reduction.

Reese River District.

WAITING FOR ORE.—*Reveille*, Jan. 24: The Manhattan mill has hung up its stamps in order to let the ore houses get filled again. The mill expected to suspend work last Monday, but the leasers kept crowding in their ore and kept it going a little longer. As soon as the ore dumps get large enough to justify starting, the mill will again begin its welcome work.

Secret Canyon District.

PROGRESSING FAVORABLY.—Eureka *Sentinel*, Jan. 24: Work is progressing favorably in many of the Secret Canyon mines. About forty men in all are delving in the bowels of the earth there for the precious metals, nearly all of whom are tributers and leasers. A visit among them on Sunday last made manifest to us the fact that while none of them are making $100 a day, there is not a man among them who wants to "strike out" for other parts. They are all apparently satisfied and sanguine that their camp and the entire of Eureka district is yet to see booming times. It is said on good authority that the men who are working in the Geddes mine are extracting some of the finest-looking ore seen in that section in a long time. Within the next ten days the building now being erected in connection with the Little Minna mine will be completed, when work in the shaft will be resumed and its depth increasd. There is no question but that this is a very promising property, the ore in the entire of the bottom of the shaft being of a good character.

Wild Rose District

THE PARADISE VALLEY MILL.—*Silver State*, Jan. 21: J. V. McCurdy, superintendent of the Paradise mill, is now in Spring City, and work will soon be commenced upon the construction of a new mill. He has purchased 90,000 ft of lumber, ten car-loads of which have arrived at this station. While in California, he purchased for the company three complete Huntington centrifugal mills, embracing nine Cornish jigs, three sizers, six Triumph concentrators, one agitating concentrator, one dryer and one rock-breaker. The mill will be driven with a Leffell wheel, with a head of 51 ft. He has secured a force of carpenters and millwrights, and will immediately have his lumber and machinery transported from this place to the mill-site, and the mill will be built and put into running order at an early day. His new mill process will be concentrating the ores. The reduction of the ores heretofore realized a very handsome profit. The company has plenty of funds on hand for rebuilding, and therefore there will be no delay. The mill will be of 24-ton capacity, and Mr. McCurdy says that as soon as the works are in operation, the company will immediately be able to resume the paying of dividends. The mines of the company—the Paradise Valley and Wild Goose—show large bodies of ore in all their levels, which assay to a large figure. At the present time there are 700 tons of good ore and a large quantity of concentrations at the mill-site. When the company get well at work again, the Wild Goose will be prospected by going into the lower level of the Paradise, which is now in 800 ft, and by drifting 500 ft the Wild Goose ore will be cut at the depth of 700 ft. This will require an air-compressor, and a total outlay of about $10,000. When the mill starts up, things will look cheerful and lively around Spring City, and, in fact, we shall all feel the good effects of the coin that will be distributed about in this portion of the county.

ARIZONA.

IN BAD SHAPE.—*Mining Index*, Jan. 20: The affairs of the Arizona Copper company, of Clifton, are said to be in a some what embarrassed condition owing to the decline in the price of copper. The property was bought for $1,700,000 in the first place, while the expenses incurred in building railroads, etc., were simply enormous. It is an example of the old saying that "it takes a gold mine to work a silver mine." It is to be hoped that no interruption of the working of the mines will occur, as it would throw a large number of men out of employment.

MILL FOR QUIJOTOA.—Arizona *Citizen*, Jan. 24: The Bonanza mining companies' who have bought the Hermosa mill at Harshaw, have brought men down from Nevada to take it down and will proceed to move it to Quijotoa at once. Mr. Patton, who has the business in hand, arrived here this morning and will see to the erection of the mill at Quijotoa. This mill is of 20 stamps, with capicity for 40. It is one of the best plants ever brought to this Territory and cost about $160,000. It is erected to make way with the surplus ore that has accumulated in developing the mines. Other mills of larger size will be added when sufficient developments are made to permit of the mines being worked to their full capacity.

KING.—J. H. Brown and Chas. Luedke, of Silver King, spent several days in Globe this week. They report business at the King unusually brisk. The King mine is working a full force and the mills are kept steadily running. The Lost Prize, of which W. E. Spence is superintendent, they say is one of the very best silver mines in the district. Large hoisting works have been secured and work in the mine is being earnestly prosecuted. Two wagon loads of Lost Prize ore were sent to Benson for reduction, one day this week. Work is being done on various other claims in the King district, which contributes to the general prosperity of the camp.

FAME.—The owners of the Fame silver mine on Quartzite hill, are developing that valuable property in a systematic manner. The tunnel in which work is now being prosecuted, is in 300 ft and the ore maintains its high grade. A track will soon be laid the entire length of this tunnel, which will facilitate the moving of the ore. A Burleigh drill has been secured and will be used immediately for prospecting the mine. There are other claims on Quartzite, which promise well, considering the hard work done on them.

COLORADO.

GEORGETOWN.—*Courier*, Jan. 22: Work has been resumed on the Peters mine which has lain idle for a long time. Georgetown tunnel struck despair on the north wall of the Griffith, and are cross-cutting to the south wall. Hensley & Co. are working the Range Line lode at Dumont, and are taking out good quantities of ore. Clark & Darling have taken a lease upon the No. 8 lode in the Diamond tunnel and commenced work this week. Bowden, Kneebone & Co. have struck a four inch streak of ore in the Maine, which shows gray copper and ruby. A large streak of honey-comb quartz is shown in the bottom of the Dew Drop shaft, from which many fine specimens of free gold have been taken. Quite a large force of men are working on the Snowdrift at present. A portion of them are leasing, while others are putting the mine in order for extensive work. The Frostburg mine is turning out large quantities of low-grade mineral. A drift is being driven from the bottom of the Frostburg shaft to cut the old Dunderberg shaft. Moore & Co., lessees on the Joe Reynolds, employ about 30 men and the ore shipments are very large. The ore is all shipped to the Idaho Springs, a fact which Georgetown greatly regrets. Lynn, Hinds & Co., have struck good pay in the lowest level of the Baltimore mine, going east from the shaft. Peterson & Co. going west on the same level, also have a fine streak of good ore. The Victoria tunnel has been passing a tough quartzite for the past two months, and headway is necessarily slow. The contractors have sub-let their contract at an advanced figure. The tunnel is to be driven about 175 feet further. Simmons & Co. are driving the Star of the West tunnel to cut the Cass county lode, upon which they have a lease. The heading is now beyond the apex of the lode, and they expect to cut the vein at any time. The Olive Carr lode, which adjoins the Cass county, will be opened up by the tunnel. In the heading of an adit on this vein, five inches of very good mineral was recently struck. The Home Sweet Home lode at the head of Fall River is turning out a good producer of gold ore. A 100 foot adit has been driven in the breast of which there are three feet of quartz which returns $50 gold per cord under stamps. The weekly returns are about $400. Two men are employed and they keep a 5-stamp mill running day and night. The owners are John Owen and John Tucker.

IDAHO.

LITTLE ROCKIES.—Cor. Ketchum *Keystone*, Jan. 20: I will give you a short sketch of the country. There are six small gulches carrying gold in paying quantities; that is, will pay from $3 to $6 or $7 per day. More will get $3 than $7. These gulches are all short, steep, and very narrow, and the pay streak small; consequently the placer ground will last but a few months in the spring, at best. As for quartz, there is but little known as yet whether there is any chance for a quartz camp or not. I have some locations carrying gold and some that is all galena, but they will have to be very rich to ever pay, as the ledges are small. I have sent ore out to have tested; will know when I get returns. I think I have the best ledges found so far, but don't feel much elated over what I have. This is a small mineral-bearing country—60 miles will take one clear around the Little Rockies. In the center there is two high peaks of porphyry and granite, in which all those gulches head that carry gold. From the foot-hills half way up to the summit is lime or what experts would call dolonite, with no indications of mineral whatever, so far as I have been able to examine.

WONDER.—Ketchum *Keystone*, Jan. 20: Mr. Joseph Galatian came down from the Wonder the other day, and from him I learn that the mine is looking remarkably well, and they intend to have a good supply of ore sacked, ready for shipment in the spring. There is a four foot vein of ruby silver, from which the following assays have just been made: No. 1, sampled (8 inches wide) $710 per ton; No. 2, $17.90; No. 3, $84; No. 4, $99. It is gratifying to learn of the prosperity of our mines, and it gives renewed courage to wait patiently for the long looked for good times.

THE LAST CHANCE MINE.—Wood River *Times*, Jan. 23: Robert W. Chapin, of New York City, has finally, after prolonged negotiation, succeeded in securing a lease upon the Last Chance mine and Mattingley mill, at Atlanta, the property of the Atlanta Hill Mining and Milling Company. The lease is to run for ten months from January 9, 1885, and Mr. Chapin agrees to expend at least $1,500 per month on the property, or $15,000 altogether, and to sink the main shaft at least 50 ft deeper. The people of Atlanta will be glad to learn that this excellent property is at last to be exploited in a workman-like manner. Adjoining the Atlanta and Buffalo mines, and having yielded large sums of money, notwithstanding the grossest mismanagement, there is no better gold claim in the country than the Atlanta Hill.

THE EUREKA MINE.—At the Eureka mine, Bullion, the ore-body is fully eight ft in width, and so easily worked that four men can knock down 15 tons a day—the quantity of first-class ore shipped from the mine. A large force was employed for a while, but about one week ago most of it was laid off, as the concentrating works and teams were unable to keep up with the output of ore.

MONTANA.

THE GRANITE MOUNTAIN MINE.—The *Inter-Mountain's* Helena correspondent writes that Hon. F. L. Perkins speaks glowingly of the outlook of the Granite Mountain property. He claims that the new 20 stamp mill, built by Frazer & Chalmers, which was started into operation on the 10th of December is the most perfect structure of its kind in the world. From the 10th to the 31st of December, the bullion product was $60,000. Since that time the output has averaged $17,000 per week, and it is expected that by making certain changes in the stamp screens it will be increased to $20,000 weekly, or at least $75,000 per month. The ore at present being treated, Mr. Perkins states, pulps $130 per ton and the amount of it in sight gives assurance of large and continuous dividends in the future. The Granite Mountain is a remarkable prosperity and the intergrity and ability of the management leave no room to doubt that it is being developed with an eye single to the interests of the stockholders.

BLACK ROCK.—Butte *Miner*, Jan. 21: This property owned by Clark and Warren, and leased for six months, is in a promising condition. The main shaft on the lead had been sunk 30 feet, and a tunnel run in 50 feet. Since the influx of extra miners and practical men, this lead and quite a number of others in the vicinity have been taken hold of and will be explored in a workman-like manner. From the face of the tunnel the new lessees ran in about 10 feet, and striking a 10-foot vein of free-milling ore, began sinking. They are down now about 20 feet in the tunnel and taking out 40 ounce ore, which is sent to the Colorado smelter for treatment.

EVELINA.—Swain and Hitsleton have leased this mine for one year and for the past few months have been engaged in erecting cabin, shaft house and other buildings and otherwise getting ready for active operations. The vein of ore at the Evelina is well defined and five prospect holes from 20 to 30 feet deep have been sunk along the ledge.

THE SHARK LODE.—Lays between the Little Darling and Nautillus and was owned by John H. Curtis and John Ducle. Yesterday Green Majors purchased a one-third interest in the lead and the mine will be gotten in readiness for actual development. Three holes from 15 to 20 feet in depth have been sunk along the lead and one of them will be continued and known as the shaft. The ore body shows eight feet of ore which samples, across the face 20 ounces.

NEW MACHINERY.—*Inter-Mountain*, Jan. 20: Parke, Lacy & Co. have furnished a new style iron geared horse whim for the Blue Bird mining company, Independence district. It was put in operation Tuesday, and gives the utmost satisfaction. The first cost and cost of erection is less than the old style whim, and it will hoist from 500 to 700 pounds, 60 to 70 feet per minute. The above firm have a justifiable pride in the working of this new piece of machinery.

NEW MEXICO.

GENERAL NOTES.—Silver City *Enterprise*, Jan. 17: Ore has been struck on the Franklin, at Fleming. The Mimbres and McGregor mills started up on Wednesday, after remaining idle for several days, being unable to obtain wood and ore, owing to the bad condition of the roads. Williams Bros. and E. G. Shields are getting out about 5 tons of ore a day from the Sherman mine, and much of it is of excellent quality. The ore body is exposed for a width of 15 ft. There is no truth in the report circulated last week to the effect that the bond on the Young Man mine has been thrown up. Two cars of high-grade ore were shipped from this property last week and 80 tons more are ready for shipment, and will be sent to Socorro for treatment, as fast as teams can be procured to haul it. The mine is looking better every day. The Chance mine, at Victorio, owned by Haggins, Head & Hearst, is proving to be one of the rare gems as a producer of southern New Mexico. For many months this property has paid but little more than expenses, as the grade of ore which was being worked was very low and the dead work that was constantly in progress combing with the high cost of shipping and treating, to consume the proceeds of the mine. Last week the owners were rewarded for their exploitations in blasting into the largest ore body thus far encountered upon the property. Neil Boyle, the superintendent, has no hesitancy in pronouncing it a bonanza. It is a very desirable grade of carbonate ore running high in silver and is much sought after by the smelters.

GOLD HILL.—After a month and a half of careful inspection I cannot but conclude with many others that this camp has one of the most promising outlooks of any in the Territory. Judging from surface indications there has never been a camp that showed so great a promise with so little development. The ore shows on the surface in a free state, gold and silver predominating and there seems to be no scarcity of the precious metals. The formation is a contact of porphyry and granite. Every few days brings the announcement of a new strike, and assays of from $500 to $5,000 are of no uncommon occurrence. One of the most promising prospects is the Grand Tower mining claim, owned by Lewis & Cottrell. They have two leads on which they are working. Shaft No. 1 carries native and horn silver in profuse quantities. On shaft No. 2 they are about 10 ft below the surface, having a full breast of ore that carries native silver in abundance. Bob McCone has just made a new strike showing a vein of about 20 inches, assaying 1 hear, $1,500. Snyder & Snowden are taking out ore from their claims. Kennedy & Neddo are taking out ore from their claims. Black Parks & Co. are preparing to ship. Cunningham is preparing to ship from the Reservation. Giddings & Miller are shipping from their claims. Goodwin is preparing to ship from his silver claims. Snyder & Hensley have struck native silver in their claims. James Winters has also native and horn silver in plenty on his claim. There is a general appearance of activity and bustle about the camp which is dotted all about with tents. Prospectors are daily coming in and there are in and about camp fully 200 men prospecting and mining. Some ores have been treated at Socorro by the Billing smelter but the returns were not to the entire satisfaction of all parties. One man sent two samples of ore, one to Billing and one to Benson, from the same mine, carefully selected. The returns from Billing was a charge of $5 for sampling; from Benson, $50 net. There was free gold to be easily seen in almost every piece of rock sent. I apprehend the Socorro works will not reduce much Gold hill ore

OREGON.

NOTES.—More rain is wanted. The miners of Josephine county have plenty of water and are making the most of it. T. J. Neff and others are engaged in mining in the Wagner Creek district, and expect to do well. Jas. T. Jones of Siskiyou county, Cal., has gone to Rock Point, in the vicinity of which he has a quartz ledge. Very little rain has fallen during the week and miners are inclined to become discouraged over the prospects, as most of them have little water for mining purposes. Roten Bros. have discovered some excellent diggings in the Kane Creek district, but owing to scarcity of water have done very little work. They picked up a nugget worth about $19 a few days since. A company, consisting of Messrs. Fields, Cook and Rummel, have promising diggings on Ashland creek and are digging a long ditch in which to bring water on them. They have three miles of it dug.

UTAH.

STAR DISTRICT.—Southern Utah *Times*: It looks as if we are to have a new era in Star. Some time ago Don Wickizer, by chance, found ore in a contact of lime and granite, which is extraordinary rich in silver, and seems to be permaaent from devclopments made. Your correspondent seeing the Don Wickizer mine, thought that other contacts (of which there are many in the vicinity of Shantie) might be just as fruitful, has prospected some of them and found ore of a similar character in all. From what I learn, these contacts have never been prospected at all, because the ore never crops out or throws any float from the ledge. There are a great many of these contacts on the west side of the range, where the dolomite lime and granite alternately prevails, and it is the opinion of our correspondent that the salvation of Star lies in these contacts, which will be proven if they are ever worked. We are expecting better times here next summer.

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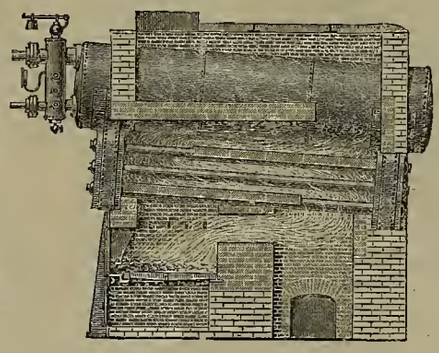

TESTIMONIALS.

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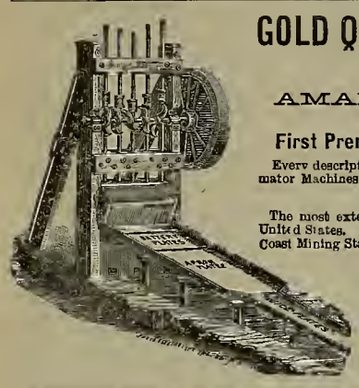

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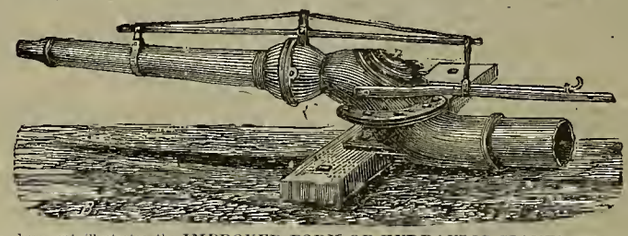

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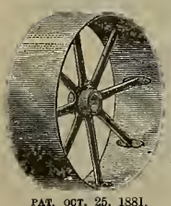

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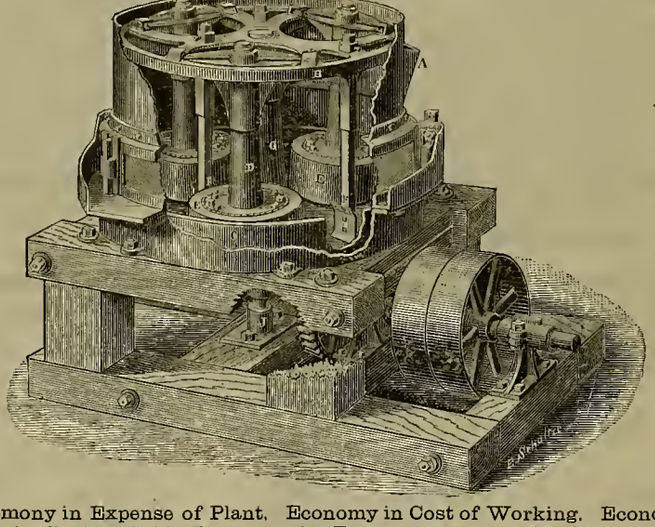

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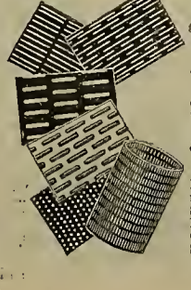

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The Senate Committees.

Two weeks ago we gave a list of the standing committees and names of committeemen of the Assembly. The following is the same enumeration as regards the Senate:

On Agriculture—Foster, Chairman; Cox, Langford, Spencer of Stanislaus; Taylor, De Long, Johnson of San Bernardino, Steele and Parker.

On Claims—Dougherty, Chairman; Beauvais, Creighton, Kelly, Boone, Parkinson and Drumm.

On Commerce and Navigation—Kelly, Chairman; Drumm, Lynch, Parkinson, De Long, Dougherty and Whitney.

On Corporations—Kellogg, Chairman; Knight, Drumm, Cross, Wright, Lowe, Vrooman, McClure and Kelly.

On Counties, County Governments and Township Organizations—Spencer of Napa, Chairman; Baldwin, Knight, Johnson of Sonoma, Johnson of San Bernardino, Parker and Chandler.

On Education—Johnson of Sonoma, Chairman; Perry, Lynch, Vrooman, Del Valle, Boone, Spencer of Stanislaus.

On Engrossed Bills—Filcher, Cross, Mahler, Kellogg, Palmieri and Routier.

On Enrolled Bills—Cox, Filcher, Langford, Steele, Wallis and Spencer of Stanislaus.

On Federal Relations—Baldwin, Whitney, Drumm, Dougherty and Wallis.

On Finance—Knight, Cox, Kellogg, Days, De Long, Johnson of San Bernardino and Vrooman.

On Hospital—Knight, Saxe, Wright, Baldwin and Spencer of Stanislaus.

On Judiciary—Cross, Taylor, Speneer of Napa, Reddy, Baldwin, Johnson of Sonoma, Kellogg, Vrooman, Lowe, McClure, Del Valle, Perry, Whitney, Days and Boone.

On Military Affairs—Drumm, Baldwin, Foster, Lynch, Perry, Lowe and Boone.

On Mines, Drainage and Mining Debris—Mahler, Kellogg, Cross, Filcher, Wallace, Hurlhurt and Beauvais.

On Public Buildings—Baldwin, Spencer of Napa, Creighton, Dougherty, Lowe, Vrooman and Days.

On Public Swamp and Overflowed Lands—Cox, Parker, Langford, Foster and Vrooman.

On Public Morals—Saxe, Johnson of Sonoma, and Chandler.

On Public Printing—Spencer of Stanislaus, Filcher and Steele.

On Roads and Highways—Langford, Beauvais, Knight, Steele, Taylor, Hurlburt, and Johuson of San Bernardino.

On State Library—Del Valle, Cross and Hurlburt.

On State Prison and Prison Buildings—Reddy, Foster, Spencer of Stanislaus, De Long, Knight, Kelly, Routier, Parkinson and Perry.

On Irrigation and Water Rights—Taylor, Saxe, Reddy, Johnson of San Beruardino, Cross, Whitney, Foster, Del Valle and Beauvais.

On Fish and Game—Foater, Wright, Cox, Kelly and Parker.

On Elections—Kellogg, Wright, Spencer of Napa, Drumm, McClure, Vrooman and De Long.

On City, City and County and Township Governments—Johnson of Sonoma, Cox, Dougherty, Del Valle, Johnson of San Bernardino, McClure and Whitney.

On Labor and Capital—Dougherty, Creighton, Lynch, Days and Chandler.

On Chinese and Chinese Immigration—Kelly, Chandler, Lynch, Foster, Palmieri, Steele and Routier.

On Apportionment and Representation—Del Valle, Filcher, Hurlhurt, Langford, Reddy, Chandler, Spencer of Napa, Wright and Palmieri.

On Forestry, Yosemite Valley and Calaveras Big Tree Grove—Creighton, Spencer of Stanislaus, Cox, Beauvais and Saxe.

Mining Share Market.

There has been no special animation in the mining share market this week, prices having remained low. The shutting down of all work below the Sutro Tunnel level has taken away the confidence of some operators in Comstock shares.

At the north end the Sierra Nevada Company are preparing to resume work in the many veins they possess in Cedar hill. There are scores of old miners here who would like nothing better than to be allowed to go upon Cedar hill and help themselves to what they could find. The Ophir, Mexican and Union Consolidated are now running a drift north on the 500 level preparatory to the exploration of a great scope of ground at that depth passed by without examination in the early days. At the Best and Belcher and Gould and Curry they are opening a station at the 1000 level of the Bonner shaft, from which will be run a north lateral drift which will open up a large area of hitherto unexplored country. At the middle mines all is going on well.

Down at Gold hill the Yellow Jacket, Crown Point and Belcher Companies are going on the even tenor of their way. They are steadily extracting sufficient ore to keep the mills on the Carson river in full blast.

REMOVALS.—The California Wire Works have moved to their new premises, at 329 Market street, corner of Fremont. Morris & Varney, dealers in iron, steel and heavy hardware, are now occupying the premises formerly used by Whitney & Marshall, 22 and 24 Fremont street.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M and M Co	Alaska	3	50	Dec 10	Jan 11	Jan 31	T J Hay	306 Pine st
Alpha Con M Co	Nevada	19	50	Jan 20	Feb 26	Mar 21	W Willis	309 Montgomery st
Acme M and M Co	California	8	12	Jan 14	Feb 20	Mar 13	J M Buffington	309 California st
Arnold M Co	Arizona	3	1 00	Jan 3	Feb 7	Mar 2	A Judson	320 Sansome st
Black Bear M Co	California	2	25	Dec 20	Jan 26	Feb 20	W L Oliver	328 Montgomery st
Bulwer Con M Co	California	1	20	Jan 13	Feb 24	Mar 31	W Willis	309 Montgomery st
Cuevas Santa M Co	Mexico	5	25	Jan 22	Feb 27	Mar 29	W L Oliver	328 Montgomery st
Champion M Co	California	18	10	Jan 28	Mar 6	Mar 26	T Wetzel	522 Montgomery st
Caledonia M Co	Dakota	15	15	Jan 27	Mar 9	Apr 6	W L Oliver	328 Montgomery st
Con Virginia and California	Nevada	2	20	Jan 15	Feb 20	Mar 21	A W Havens	300 Montgomery st
Copper Mt Con M Co	California	1	05	Dec 3	Jan 13	Feb 10	A L Perkins	310 Pine st
Eintracht Gravel M Co	California	17	05	Dec 9	Feb 7	Feb 16	H Kuntz	320 Sansome st
Exchequer M Co	Nevada	21	20	Jan 2	Feb 5	Feb 26	C C Elliott	309 Montgomery st
Hazard G M Co	California	6	05	Jan 21	Feb 23	Mar 28	J T McGeoghegan	318 Pine st
Happy Valley Gravel M Co	California	5	08	Dec 15	Jan 21	Feb 9	D M Kent	330 Pine st
Hale & Norcross S M Co	Nevada	83	50	Dec 8	Jan 13	Feb 3	J F Lyghtner	309 Montgomery st
Independence M Co	Nevada	14	13	Jan 21	Mar 2	Mar 30	J W Few	310 Pine st
Martin White M Co	Nevada	19	25	Jan 15	Feb 25	Mar 25	J J Scoville	309 Montgomery st
Mammoth Bar M Co	California	7	10	Jan 19	Feb 20	Mar 13	J W Few	310 Pine st
Mayflow-r Gravel M Co	California	28	10	Jan 20	Feb 27	Mar 20	J Morizio	328 Montgomery st
North Gould & Curry M Co	Nevada	8	05	Jan 12	Feb 13	Mar 2	C H Mason	331 Montgomery st
Peer M Co	Arizona	2	50	Jan 14	Feb 19	Mar 16	A Waterman	309 Montgomery st
Peerless M Co	Arizona	3	50	Jan 14	Feb 18	Mar 14	A Waterman	309 Montgomery st
Potosi M Co	Nevada	17	25	Jan 27	Mar 2	Mar 24	C L McCoy	309 Montgomery st
Sumner Con M Co	California	1	05	Dec 18	Jan 19	Feb 12	F E Isaty	350 Pine st
Silver Lining M Co	Nevada	1	07	Dec 16	Jan 24	Feb 19	J. Stadfeld	419 California st
Silver Hill M Co	Nevada	21	15	Jan 9	Feb 13	Mar 6	W E Dean	309 Montgomery st
Utah S M Co	Nevada	52	50	Dec 19	Jan 26	Feb 14	C C Pratt	309 Montgomery st
Virginia Creek Gravel Co	California	1	20	Dec 20	Jan 25	Mar 2	J M Quay	406 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Con Amador M Co	California	F B Latham	408 California st	Annual	Feb 2
Holmes M Co	California	C T Bridge	224 California st	Annual	Feb 10
Sulphur Bank Q M Co	California	L Hermann	220 Sansome st	Annual	Feb 2
Trinity M Co	California	J M Seltridge	401 California st	Annual	Feb 4

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	B L Burling	328 Montgomery st	50	Dec 5
Ountention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Dec 15
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Oct 8
Jackson M Co	California	D C Bates	309 Montgomery st	10	Dec 27
Kossuth M Co	Nevada	C K Stretevant	328 Montgomery st	06	Mar 16
Navajo M Co	Nevada	J W Few	310 Pine st	25	Jan 15
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Nov 28
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Jan 15
Syndicate M Co	California	J Stadfeldt	419 California st	10	Nov 6

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE.	Portland. Rain.	Temp.	Wind.	Weather.	Red Bluff. Rain.	Temp.	Wind.	Weather.	Sacramento. Rain.	Temp.	Wind.	Weather.	S. Francieco. Rain.	Temp.	Wind.	Weather.	Loe Angelee. Rain.	Temp.	Wind.	Weather.	San Diego. Rain.	Temp.	Wind.	Weather.
Jan 22-Jan 28																								
Thursday	.00	38	S	Cy.	.00	53	N	Cl.	.00	—	—	—	.00	50	NE	Cl.	.00	61	SE	Fr.	.00	61	SW	Cl.
Friday	.03	43	S	Cy.	.01	51	N	Cy.	.01	43	E	Fy.	.00	48	NE	Cy.	.00	59	E	Fr.	.00	61	S	Cl.
Saturday	.03	39	SW	Fy.	.00	54	N	Cl.	.01	—	SE	Cl.	.00	51	NE	Cl.	.00	57	NW	Cl.	—	59	W	Fr.
Sunday	.00	37	—	Fy.	.00	51	N	Cl.	.00	45	N	Cl	.00	51	N	Cl.	.00	62	SE	Cl.	.00	61	W	Cl.
Monday	.00	33	—	Fy.	.00	52	NW	Fr.	.00	49	N	Fr.	.00	52	SE	Cy.	.00	67	NE	Cl.	.00	64	NW	Cl.
Tuesday	.00	34	N	Fy.	.00	51	N	Fr.	.00	52	N	Cy.	.00	54	N	Cy.	.00	63	E	Cy.	.00	63	NW	Cy.
Wednesday	.00	41	—	Cy.	.00	52	N	Cy.	.05	51	NW	Cl.	.17	56	NE	Cy.	.00	66	S	Cl	.00	64	W	Cl.
Totals	.06				.00				.05				.17				.00				—			

EXPLANATION.—Cl. for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature wind and weather at 11:58 A. M. (San Francisco mean time), with amount of rainfall in the preceding 24 hours.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Jan. 8.		WEEK ENDING Jan. 15.		WEEK ENDING Jan. 22.		WEEK ENDING Jan. 29.	
Alpha	.70	.80	.45	.50	.25	.30	.10	.15
Alta	.05	.30	....	.30	.25	.30	.25	.30
Andes	.10	.15	....	.10	....	.10	....	.10
Argenta	....	.05	....	....	....	....	....	....
Belcher	.65	.70	.65	.80	.70	.75	....	.80
Belding	....	....	....	....	....	....	....	....
Best & Belcher	1.10	1.35	1.10	1.25	.55	1.25	.70	.90
Bullion	.20	.25	....	.25	.15	.20	....	.20
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	.15	....	....	....	....	....	.15
Bodie Con	1.95	2.10	1.95	2.10	1.90	2.05	1.90	1.95
Benton	.05	.65	....	.05	....	.05	....	.05
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.25	.35	....	.25	....	.10	....	.05
California	.25	.35	....	.30	.10	.30	.10	.15
Challenge	....	.25	....	....	....	....	....	.15
Champion	....	....	....	....	....	....	....	....
Chollar	1.70	2.15	1.75	1.95	1.25	1.35	1.15	1.45
Confidence	.85	.90	.75	.90	.75	.90	....	....
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.25	.35	....	.30	.10	.30	.10	.15
Con. Pacific	....	1.10	1.00	1.15	.90	1.85	.75	.80
Crown Point	.75	.95	.80	.90	.80	.90	.80	.85
Day	....	....	....	....	....	....	....	....
Eureka Con	....	1.15	1.15	2.00	2.10	2.40	2.25	2.75
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	.05	.15	....	.05	....	.05	....	....
Grand Prize	....	....	....	....	....	....	....	.30
Gould & Curry	.95	1.15	1.00	1.20	.50	1.15	.65	.70
Goodshaw	....	....	....	....	....	.05	....	.05
Hale & Norcross	3.40	3.75	3.60	5.00	2.40	5.13	2.60	3.95
Holmes	4.55	4.80	....	4.75	4.50	4.75	....	4.65
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	....	....	....	.15	....	.10	....	....
Martin White	....	.35	....	....	....	....	....	....
Mono	1.25	1.80	1.25	1.55	1.05	1.45	1.05	1.20
Mexican	.50	.65	.40	.55	.25	.50	.30	.40
Mt. Diablo	....	....	3.50	3.60	....	3.75	....	....
Northern Belle	....	....	....	....	....	....	....	....
Navajo	1.85	2.05	1.75	2.00	1.65	1.80	1.60	1.70
North Belle Isle	.15	.20	....	.15	.10	.20	....	....
Occidental	.75	.85	.90	1.00	.75	.90	.75	.80
Ophir	.50	.65	.40	.55	.25	.50	.35	.40
Overman	....	.10	.05	.10	....	....	....	....
Potosi	.65	.80	.70	.90	.50	.80	.40	.50
Pinal Con	....	....	....	....	....	....	....	....
Savage	1.60	1.85	1.60	2.00	.90	2.00	.80	1.10
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	.60	.75	.50	.65	.35	.70	.40	.50
Silver Hill	....	....	....	....	....	....	....	....
Silver King	....	....	4.00	5.00	....	4.00	3.50	4.00
Scorpion	.05	.15	....	.10	....	.10	.10	.15
Syndicate	....	.30	....	.40	....	....	....	.45
Tioga	....	....	....	....	....	....	....	....
Union Coo	.50	.60	.50	.65	.35	.60	.35	.45
Utah	.15	.20	.15	.50	.15	.55	....	....
Yellow Jacket	1.20	1.60	1.20	1.25	....	....	....	....

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Jan. 29.

150 Alta	30	300 Bodie	1.05
100 Bodie Con	2.00	200 Belcher	.85c
50 B. & Belcher	.75c	525 B. & Belcher	.80@85c
200 Bullion	.10c	50 Belmont	.30c
400 Bulwer	.05c	100 Benton Con	.05c
200 Belmont	....	100 Chollar	1.45
600 Chollar	1.35@1.40	200 Crown Point	.80@85c
70 Con Va & Cal	.10c	34 Con Va & Cal	.15c
30 Confidence	.75c	840 Gould & Curry	.65@70c
100 Crown Point	.80c	100 Goodshaw	.05c
50 Gould & Curry	.60c	3550 Hale & Nor	2.95@3.95
2830 Hale & Nor	2.85@3.00	50 Holmes	4.65
30 Mexican	.35c	800 Mono	1.10@1.15
50 Mono	1.15	220 Mexican	.30c
100 Navajo	1.70	115 Ophir	.30@35c
100 Ophir	.40c	10 Occidental	.75c
50 Occidental	.80c	510 Sierra Nevada	.40c
150 Potosi	.40c	1585 Savage	1.05@1.10
650 Sierra Nevada	.35@.45c	25 Scorpion	.15c
700 Savage	.8.5@90c	50 Silver King	4.00
170 Union Con	.40@45c	795 Union	.35@40c

AFTERNOON SESSION.

300 Bodie	1.05		
200 Belcher	.85c		
525 B. & Belcher	.80@85c		
50 Belmont	.30c		
100 Benton Con	.05c		
100 Chollar	1.45		
200 Crown Point	.80@85c		
34 Con Va & Cal	.15c		
840 Gould & Curry	.65@70c		
100 Goodshaw	.05c		
3550 Hale & Nor	2.95@3.95		
50 Holmes	4.65		
800 Mono	1.10@1.15		
220 Mexican	.30c		
115 Ophir	.30@35c		
10 Occidental	.75c		
510 Sierra Nevada	.40c		
1585 Savage	1.05@1.10		
25 Scorpion	.15c		
50 Silver King	4.00		
795 Union	.35@40c		

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Jan. 29, 1885.

ANTIMONY—Per pound		- @	—
Hallett's		12½@	—
Cookson's		13 @	—
BORAX—Refined		7¼@	8
IRON—Glengarnock ton		23 00 @	—
Eglinton, ton		22 00 @	—
American Soft, ton		21 00 @	—
Oregon Pig, ton		— @	—
Clipper Gap, Nos. 1 to 4		25 00 @	30 00
Clay Lane White		26 00 @	—
Shotts, No. 1		26 00 @	—
Refined Bar		3 @	¼
Boiler, 1 to 4		5 00 @	5 50
STEEL—English, lb		16 @	25
Black Diamond, ordinary sizes		10 @	—
Plow		6 @	8
Machinery		10 @	12
COPPER—			
Brazers' sizes		— @	25
Fire-box sheets		28 @	—
Slabs, old		22 @	—
Yellow Metal		14 @	15
LEAD—Pig		3½@	3¾
Bar		5 @	—
Pipe		7 @	—
Sheet		8 @	—
Shot, discount 10% on 500 bag	Drop, ½ bag	1 85 @	—
Buck, ½ bag		2 05 @	—
Chilled, do		2 25 @	—
TINPLATE—Oldcastle		5 25 @	6 00
Charcoal		5 75 @	6 75
Coke		5 25 @	5 50
Rosina		6 25 @	13 00
ZINC—German		9 @	10
Sheet, 7x3 ft, 7 to 10 lb, less the cask		9 @	10
QUICKSILVER—By the flask		32 50 @	33 00
Flasks, new		1 05 @	—
Flasks, old		85 @	—
NEW YORK PRICES—			
California Borax, refined		8½@	9
Pig Iron, American No. 1		18 50 @	19 00
Pig Iron, American No. 2		17 00 @	17 50
Quicksilver		48 @	50
Lead		3 50 @	3 67½
Copper		— @	11¾
Tin		17 @	—
Bar Silver		1 07½@	—

QUEEN VICTORIA and the council have ratified the hethrothal of the Princess Beatrice and Prince Henry of Battenburg.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & CO.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING JANUARY 13, 1885.

310,549.—AMALGAMATOR—M. P. Boss, Oakland, Cal.

310,656.—ROCK CRUSHER—A. G. & J. M. Dyer, S. F.

310,859.—PIPE AND DRAIN TILE MOULD—Earl & Hazard, Los Angeles, Cal.

310,671.—SPREADER FOR THRASHERS—Geo. W. Gould, Yolo, Cal.

310,672.—HOSE COUPLING—S. R. Hackley, Crockets, Cal.

310,673.—DEVICE FOR SECURING MOULDINGS—C. Halstrom, Los Angeles, Cal.

310,585.—WHEEL FOR VEHICLES—W. H. Harding, Springfield, Cal.

310,825.—BLOWER FOR FIRE GRATES—S. C. Houghton, S. F.

310,710.—GUIDE FOR BORING DOORS FOR LOCKS—C. F. Nichols, S. F.

310,610.—TICKET HOLDER—W. Patterson, S. F.

310,679.—ORE FURNACE—E. F. Russell, S. F.

310,621.—TWO-WHEELED VEHICLE—J. G. Stocks, S. F.

310,744.—GAS RETORT—A. C. Swain, Chico, Cal.

310,746.—TWO-WHEELED VEHICLE—Taliaferro & Mitchell, Hueneme, Cal.

FOR WEEK ENDING JANUARY 20, 1885.

310,932.—BOOT NAILING MACHINE—A. Cavalli, S. F.

310,892.—PERMUTATION LOCK—Chas. Hill, Los Angeles, Cal.

311,013.—ICE MACHINE—J. C. Kitton, S. F.

310,951.—HAY CARRIER, ETC.—I. N. Matlick, San Jose, Cal.

310,952.—HAY ELEVATOR, ETC.—I. N. Matlick, San Jose, Cal.

311,032.—QUARTZ MILL—A. E. Redstone, S. F.

311,041.—SIDE HILL SULKY PLOW—A. D. Sewell, Colton, W. T.

311,149.—CHIMNEY FOR DWELLING HOUSES—W. E. Stevens, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise), at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

FILLING MACHINE FOR CANS, ETC.—Jamea J. Gorman, Temescal, Alameda Co., No. 310,268 Dated Jan. 6, 1885. This is a filling machine for cans and other vessels of that class, in which the supply for filling the series of vessels is regulated automatically, by means of a displacement weight or body; and the invention consists in a peculiar arrangement of tanks, measuring cups, displacement body, and feed and discharge mechaniams. The object is to provide a machine which is adapted to provide automatically a supply of liquid, and to feed the supply in stated quantities to the cans or other vessels to be filled.

HORSE-SHOE NAIL.—Joseph Cairn Simpson, Oakland, No. 310,231. Dated January 6, 1885. This sort of nail is usually made of the best and softest iron obtainable, in order to give them sufficient ductility to form a proper clinch; but this softness makes them difficult to drive, and in addition to this, when cold pressed they become fibrous, so as to be easily split, in which case the horses foot may be seriously wounded when they are driven. Mr. Simpson forms his improved nail of prepared steel, having sufficient ductility to form a clinch without breaking. He prepares them in a peculiar way and forms one side convex and the other concave for a part of its length. When the nail is turned over, the edges of the concave portion will be imbedded into the surface of the hoof, and will be close and smooth, and the convex surface will be less likely to wound the opposite leg if it should be struck.

Bullion Shipments.

Minnie Moore, Jan. 20, $3,220; Ontario, 20, $21,958; Minnie Moore, 22, $5,570; Stormont, 25, $1,710; Minne Moore, 25, $2,300; Vienna, 25, $3,940; Christy, 25, $4,900; Queen of the Hills, 27, $8,000; Crescent, 27, $10,000; Vienna, 27, $3,830; Minnie Moore, 27, $2,126. There were shipped from Salt Lake during the week ending January 24th, one car refined lead, 22,056 pounds; seven cars ore, 199,230 pounds and twenty-five cars bullion, 544,666 pounds; making a total of thirty-three cars, aggregating 765,952 pounds.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
J. J. BARTELL—Sacramento and San Joaquin Counties.
A. C. KNOX—San Benito and Monterey Counties.
OKO. MCDOWELL—Santa Clara County.
WM. H. COOK—Fresno County.
G. W. INGALLS—Arizona.
W. WHITWELL—Oregon.
M. S. PRIME—Alameda County.
MRS. OZIER—Humboldt County.
E. G. NORTHUP, Sacramento County.

Concentrator Patents.

EDITORS PRESS:—Our attention has been directed to an article which appeared in your valuable journal of January 17th inst., relative to the "Embrey" Ore Concentrator, in which warnings are given that imitations of that machine are being manufactured in California which "combine the movements of the 'Embrey' with the construction of the (Frue) Vanner, and are offered as novel machines, with, of course, vastly increased (?) capabilities;" and the public are also therein "warned against imitations of this the 'Embrey' machine."

The presumption is the imitating machines therein referred to are the "*Triumph*" *Concentrators*, and that mining men may be informed of the status of the patents of the "*Triumph*" *Concentrator*, the "Frue" Vanner and the "Embrey" machine, we herewith subjoin references to the Letters Patent granted for the several machines above named:

Letters Patent No. 42,970, dated May 31, 1864, were issued to Mr. C. A. Stetefeldt, covering a form of concentrating device having an *end shake* movement.

Messrs. Johnston and Smith obtained, July 0, 1867, Letters Patent No. 66,490 for a device having a *lateral* or *side-shake* movement and *an endless belt*. This patent was sold to W. B. Frue, et als., and is now known as the "Frue" Vanner. W. B. Frue, on December 22, 1874, was granted Letters Patent No. 158,057, which covered only and substantially the improvements of No. 66,490 above quoted.

A. J. Embrey secured, March 22, 1881, Letters Patent No. 239,091, for a device essentially the same as that originally patented by Mr. Stetefeldt, first above referred to (No. 42,970), and we have eminent legal advice that these Letters Patent have no legal status. It will be observed that the patents Nos. 42,970 and 66,490, i. e., the Stetefeldt, and Johnston and Smith, respectively, have expired by limitation; the first on May 31, 1881, and the latter on July 0, 1884, and that, therefore, there are no existing patents covering either the side-shake or end-shake movements, nor the use of the endless belt.

Messrs. C. D. Smith, W. A. Sanders and George E. Woodbury were granted Letters Patent No. 261,177 on July 18, 1882, for a concentrating device now known as the "Triumph" Concentrator, the right to manufacture and sell which has been assigned to ourselves, the Joshua Hendy Machine Works. The movement of this machine is an end-shake over an endless belt, and the improvements in this invention and device consist in the novel features introduced into their construction, which are briefly stated as follows:

The *endless belt* is carried upon a supplementary frame, which is mounted on *springs*. The reciprocating movement which is imparted to this supplementary frame and belt, tends to settle and retain the sulphurets, and heavy and valuable metallic particles upon the belt, until they are discharged at the proper moment; this peculiar movement is of the utmost importance, and enables these machines to perform more work than any other Vanners or Concentrators yet devised.

We are assured that it cannot be maintained that the use of the end-shake and endless belt adopted in the form of construction of the "Triumph" Concentrators are in any manner an infringement upon any existing patents, and the reasons for such an opinion are obvious, viz., that the Letters Patent covering such use have long since expired by legal limitation.

It is upon the improved features entering into the construction of the "Triumph" Concentrator, and which are amply secured by Letters Patent, and applications therefor that the vast superiority of the operation of these machines rest, and wherever competition has been had, that superiority has been unquestionably demonstrated.

At the recent exposition held in Denver, Colorado, the "Triumph" Concentrators were awarded the medal of superiority in competition with the "Frue" Vanners, the "Embrey" machines and the "Rouse" Tables.

At the mill of the Original Empire Mill and Mining Company, in Grass Valley, Nevada county, Cal., the "Triumphs" proved themselves Triumphant in a practical competitive trial lasting 24 days, and the managers of that valuable property adopted and are now using eight of these machines, and we are assured that they are giving perfect satisfaction, and is it not pertinent to ask whether the quantity of water used through the batteries of any mill, which may be deemed necessary for the proper crushing of ores, is to be gauged for the purpose of accommodating the capacity of the "Frue" Vanners, and thereby incommoding the operation of the batteries and preventing the proper amalgamation of the ores. We do not ask millmen to so accommodate the "Triumph" Concentrators.

We deem it proper to observe, in this connection, that the complaints made by the agents of the Frue Vanning Machine Company that in the trial had at the above named mill, that the Vanners were forced to take *too much water* are impotent; for the distribution of water and pulp was equalized over the four machines during their period of operation, and if the "Frue" Vanners had too much water, why did not the "Triumph" Concentrators have also *too much water*.

The fact was there made apparent that these complaints arose simply from and were due to the inferiority of the operation of the "Frue" Vanners, and the superiority of the "Triumph" Concentrators, and it was then and there demonstrated that the "Triumphs" were never crowded, but could have concentrated a much larger quantity of pulp than the crushing capacity of the batteries delivered, and herein lies the fact, substantiated during that trial, that the concentrating capacity of the "Triumph" Concentrators is largely in excess of the "Frue" Vanners, and that where three Vanners are necessary to properly concentrate a given amount of pulp, that two "Triumphs" will perform the same work.

We now tender to the "Frue" Vanning Machine Company, who are the presumed owners of the "Embrey" machine, an acceptance of their challenge for the sum of One Thousand ($1,000) Dollars, to enter into such competitive trial, at such time and place as can be mutually arranged between any given number of "Triumph" Concentrators and the same number of either "Frue" Vanners or "Embrey" machines, and we are willing to abide the results.

JOSHUA HENDY MACHINE WORKS.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

Market Reports.

Lumber at Wholesale.

The market has been moderately active, though receipts have been light of late. Quotations of cargo rates are as follows for redwood lumber, for delivery at San Francisco, Oakland, Alameda, Berkeley, Vallejo, Benicia, Port Costa, Martinez and Antioch:

ROUGH—No. 1 rough merchantable, $18; No. 2 (refuse) rough, $14; No. 1 rough boards (specified width, 10 inches and over), $19; No. 2 (refuse) do do do, $14; No. 1 rough lumber, surface one side, $21; No. 2 (refuse) do do do $18.

PICKETS—Rough square pickets, $12; rough pointed do, $14; fancy pointed do, $22.

HALF-INCH LUMBER—No 1 ½-inch surfaced, board measure, $40; No. 2 do do do, $30; No. 3 do do do, $18; No. 4 (refuse) do do do, $12; No. 1 ½-inch battens, board measure, $40; No. 2 (refuse) do do do, $32; No. 1 ½-inch siding, 12 ft. and over, b m, $40; No. 2 (refuse) do do do $32; ½-inch siding, under 12 ft, $32.

RUSTIC—No. 1 Rustic, 1x10, 12 ft and over, $33; No. 2 do do do, $32; No. 3 do do do, $31; No. 4 Rustic, 1x10, $28; No. 5 (refuse) do do do, $21; No. 1 Rustic, 1x8, 12 ft and over, $31; No. 2 do do do, $30; No. 3 do do do, $29; No. 4 Rustic, 1x8, $20; No. 5 refuse) do do, $21.

CLEAR—No. 1 surfaced and rough clear, $32; No. 2 do do do, $31; No. 3 do do do, $30; No. 4 (refuse) do do do, $24; No. 1 surfaced and rough clear, 1x8 and 1x6, $30; No. 2, do do do, $29; No. 3 do do do, $28; No. 4 (refuse) do do do, $24.

[Dimensioned, Surfaced and Rough Clear (widths and lengths), 12 inches wide and over, add $1 ₱ M (on each corresponding grade) to the above list price of "Clear."]

TONGUED AND GROOVED—No. 1 T and G, 1x4, 12 feet and over, $32; No. 2 (refuse) do do do, $24; No. 1 T and G, 1x6, 12 ft and over, $30; No. 2 (refuse) do do do, $24; T and G, 1x8, 7 to 11 ft, $29; do do, under 7 ft, $23.

TONGUED, GROOVED AND BEADED—No. 1 T, G and Beaded, 1x4, 1¼x4 and 1¼x6, 12 ft and over, $32; No. 2 (refuse) do do do, $24; T, G and Beaded, 1x4, 1¼x4 and ¼x6, 7 to 11 ft, $27; do do, under 7 ft, $22.

ROUGH CLEAR—1x6 and under in width, and under 12 ft in length, $24.

[On a credit of 60 days, or a discount at the rate of 1 per cent per month for anticipated payments, and not less than 1 per cent per month added for extension of the same].

We quote cargo rates—Pine—Merchantable Rough, $15 ₱ M; Flooring, $24.20; Stepping, $37 ₱ M; Redwood—Merchantable Rough, $18; Surfaced, $32; Rough Clear, $32; Rustic, $33; Tongued and Grooved, $30; Tongued, Grooved and Beaded, $32.

Lumber at Retail.

Retail quotations for pine, fir and spruce are as follows:

ROUGH MERCHANTABLE—(Ordinary sizes) to 40 feet long, per M ft, $22.50; Rough Merchantable, 1x0, Fencing, $22.50; do do, 1x4, do, $23.50; do do, 1x3, do, $24.50; do do, 1x4, odd lengths, $22.50; do do, 1x6, do $21.50; do No. 2, all sizes, $18.50; do Selected, $26.50; do Clear, other than for T and G and Stepping, $31.

[Rough Clear for T and G and Stepping $1 ₱ M less than price of kind for which intended.]

Dressed T and G Flooring, 1x0, No. 1, vertical grain, ₱ M ft, $38.50; Dressed T and G Flooring, 1x0, No. 1, $33.50; do do do, No. 2, $28.50; Dressed T and G Flooring, 1x3, 1x4, 1¼x4 and over, No. 1, vertical grain, $40.50; do do do, No. 1, $35.50; do do do, No. 2, $29.50; Dressed Stepping, No. 1, vertical grain, $42.50; do do, No. 1, $37.50; do do, No. 2, $28.50.

SPRUCE—Rough Merchantable, ₱ M ft, $21.50; do Clear, $35; Clear Dressed (shelving), $40; Pickets (rough) board measure, $20.50; Furring, 1x2, per lineal ft, 1c; Laths, 1 and 1-¼inch, ₱ M, $3.50; 1½-inch, $4.

[N. B.—For all sizes over 14 inches, and lengths over 40 feet, extra rates].

Retail quotations of Redwood are as follows:

ROUGH MERCHANTABLE—₱ M ft, $22.50; do Selected, $27.50; do No. 2, $18.50; Surface, No. 1 and Rough Clear, $40; do, 1x6, $37.50; do, No. 2, $30; Rustic, No. 1, 1x8, $37.50; do, No. 1, 1x10, $40; do, No. 2, $35; do, under 10ft, $35; T and G Redwood, 1x4, 1¼x4 and 1¼x6, $40; do do, 6-inch, 12 ft and over, $37.50; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; do do do, No. 2, $30; do do, Beaded 12 ft and over, $40; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; Half-inch Surface, $32.50; Pickets, Fancy, $30; do, Rough, pointed, $20; do do, square, $17.50; Siding, ½-inch, $27.50; Battens, ½ inch, per lineal ft, 1c; Shingles, ₱ M, $2.50; Shakes, Split, $14; do, Sawed, $12; Posts, per piece, 15c; Dressed Boards, ₱ M ft, $25.

On a credit of 60 days or less, or a discount of two (2) per cent for cash only. On all credits exceeding 60 days' time, not less than one (1) per cent per month to be added.

Under the rules of the Exchange, no "lump" sum will be given on any bill of lumber.

Nails.

We give the price list of the Pacific Iron and Nail Company.

FENCE AND BRAD.—10d to 60d, $2.75; 8d and 9d, $3.00; 6d and 7d, $3.25 4d and 5d, $3.50; 3d, $4.25; 2d, $5.50.

BARRELS.—¾ inch, $6.75; ⅞ inch, $5.75; 1 inch, $5.25; 1¼ inch, $4.50; 1½ inch, $4.25; 1⅝ inch, $4.25; 1¾ inch, $3.75; 1¾ inch, $3.50.

LINING.—⅝ inch, $7.25; ¾ inch, $3.75.

TOBACCO.—10d, $3.25 8d, $3.50; 6d to 7d, $3.75.

CLINCH.—6d to 30d, $4.50.

SLATING.—5d, $3.75; 4d, $3.75; 3d, $4.50; 2d, $5.75.

FINISHING.—3d, 1 inch, $8.75; 3d, 1¼ inch, $6.75; 4d, 1½ to 1⅝ inch, $4.50; 6d, 2 inch, $4.25; 8d, 2½ inch, $4.00; 10d, in ch and over, $3.75.

CASING AND BOX.—10d to 30d, $3.50; 8d, $3.75; 6d, $8.00; 4d, $4.25; 3d, $5.25.

FINE BLUED.—4d, $4.50; 3d, $5.75; 2d, $6.50.

CUT SPIKES.—All sizes, $3.00.

BOAT SPIKES.—All sizes, $3.50.

Each half keg 10 cents extra.

TERMS.—Note or acceptance at 00 days with current rate of Exchange on S. F., or a discount of 2 per cent for cash, if remitted within 10 days from date of invoice.

All accounts when due subject to sight draft without notice.

An abatement of 10 cents per keg will be allowed upon orders of 200 kegs or over.

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Lime, per barrel, $1.50@$1.00. Plaster, $2.75–3.00. Eastern Plaster, $3.00–3.25. Rosendale Cement, $2.25–2.75. Portland Cement, $3.50–3.75. Fire Brick, per 1,000, $40 @ $45, according to brand; hard, $10.00@$12,00; red, $8.00@$8.50; soft, $7.50; face, $30.00.

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Back numbers and the latest files of this paper will be found in the California Department, and also in the Newspaper Exchange Department, of the World's Fair, New Orleans. Mr. W. H. Jessup, of the horticultural section of the California Department, can be consulted on business terms for this office, extra copies, etc.

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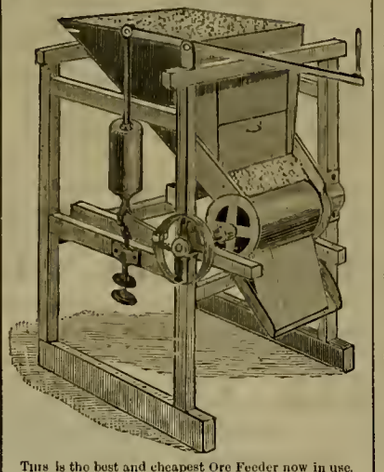

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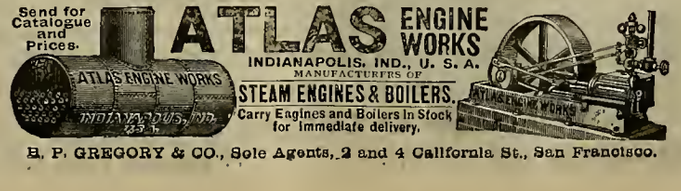

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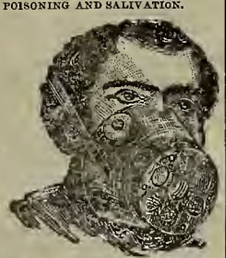

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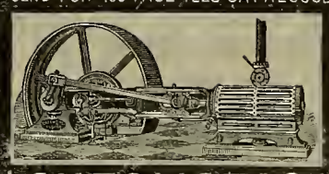

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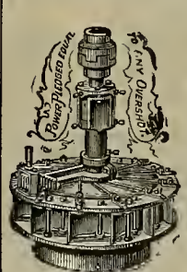

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Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address

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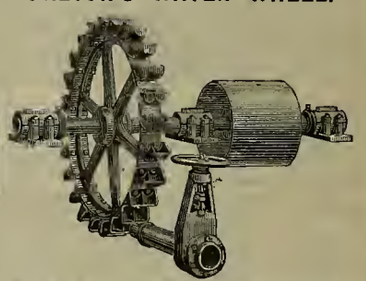

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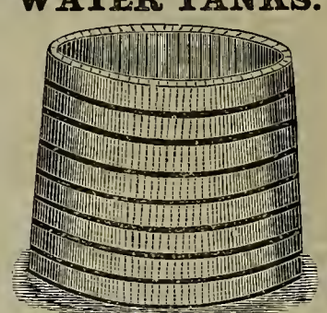

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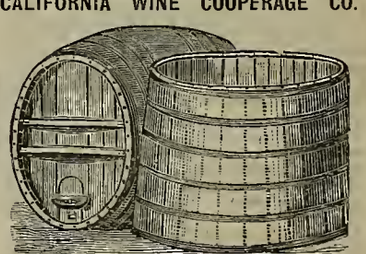

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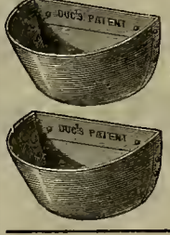

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Extra Strong and Very Durable.

Made of Best Charcoal Iron. Only One Seam. No Corners to Catch. Runs with Least Power.

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IS ACKNOWLEDGED BY USERS AS THE BEST in the world. Unlike all other Packings, the **Jenkins Standard Packing** can be made any thickness desired in a joint by placing two or as many thicknesses together as desired, and following up joint, it vulcanizes in place and becomes a metal of itself (it is frequently called Jenkins Metal), and will last for years, as it does not rot or burn out. Avoid all imitations, as a good article is always subject to cheap imitations. The genuine has stamped on every sheet "Jenkins Standard Packing," and is for sale by the Trade generally.

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☞ Manufactured only by JENKINS BROS., 71 John St., New York.

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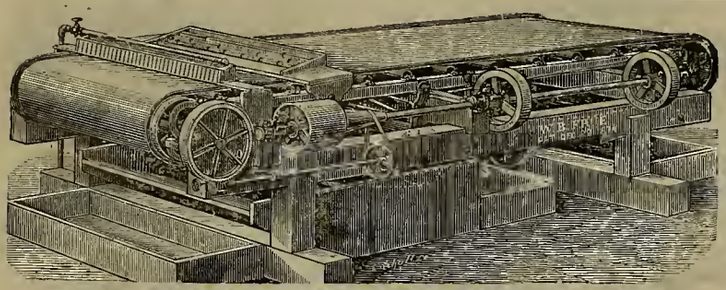
$1,000 CHALLENGE!



THE FRUE ORE CONCENTRATOR,
OR VANNING MACHINE.

PRICE: FIVE HUNDRED AND SEVENTY-FIVE DOLLARS, ($575 00), F. O. B.

OVER 1,000 ARE NOW IN USE. Saves from 40 to 100 per cent more than any other Concentrator Concentrations are clean from the first working. The wear and tear are merely nominal. A machine can be seen in working order and ready to make tests at the Fulton Iron Works, No. 220 Fremont Street, San Francisco.

As the result of a suit East against an End-Shake Machine (the Embrey), similar to the Triumph, the Frue Vanning Machine Company owns the Embrey patent, and can put in the market an End-Shake Machine of earlier patent that will do as good work as the Triumph, and superior in construction and durability. There will be no risk of suit for infringement.

The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement on patents owned by them.

Protected by patents May 4, 1869, Dec. 22, 1874, Sept. 2, 1879, April 27, 1880, March 22, 1881, Feb. 20, 1883, Sept. 18, 1883. Patents applied for.

N. B.—We are and have been ready at any time to make a competitive trial against the Triumph, or any other Concentrator for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Co.,
Room 7—No. 109 California Street, - - - SAN FRANCISCO, CAL.

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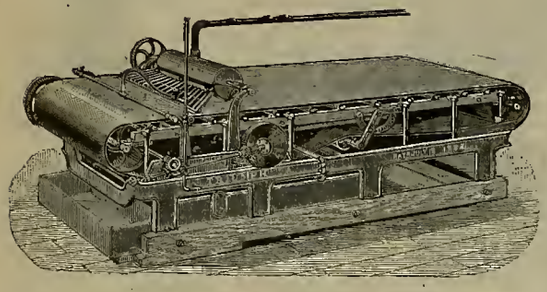

THE
"TRIUMPH" ORE CONCENTRATOR.

PRICE, FIVE HUNDRED AND FIFTY DOLLARS ($550.00), F. O. B.

THE "TRIUMPH" TRIUMPHANT!

In a competitive trial recently had between two of the "Triumph" Ore Concentrators and the same number of "Frue' Vanning Machines, at the mill of the celebrated gold producing Original Empire Mill and Mining Company, in Grass Valley, Nevada County, Cal., the "Triumphs" produced thirteen and fifteen one-hundredths (13.15) per cent more concentrations than did the "Frue" Vanners, during a run of twenty-four consecutive days, or a net gold coin result of $109.15, or $8.30 per day, in favor of the two "Triumph" Concentrators.

These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with accurate deductions therefrom, will soon be published in Circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and we hereby accept the Challenge of $1,000, flaunted by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

We guarantee purchasers against all costs, expenses or charges incurred by reason of any infringements of any existing patents.

"Put up or shut up," and "Let the Best Machine win!"

JOSHUA HENDY MACHINE WORKS,
Nos. 39 to 51 Fremont St., San Francisco, Cal.

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1850. 1885.

RANKIN, BRAYTON & CO.,
....BUILDERS OF....
MINING MACHINERY.

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127 First Street.	100 N. Clinton.	145 Broadway.

PLANTS FOR GOLD AND SILVER MILLS, embracing machinery of LATEST DESIGN and MOST IMPROVED construction. We offer our customers the BEST RESULTS OF 35 YEARS' EXPERIENCE in this SPECIAL LINE of work, and are PREPARED to furnish from SAN FRANCISCO or CHICAGO, the MOST APPROVED character of MINING AND REDUCTION MACHINERY, adapted to all grades of ores and SUPERIOR to that of any other make, at the LOWEST POSSIBLE PRICES.

We are also prepared to CONSTRUCT and DELIVER in COMPLETE RUNNING ORDER, in any locality, MILLS, CONCENTRATION WORKS, WATER JACKET SMELTING FURNACES, HOISTING WORKS, PUMPING MACHINERY, ETC., ETC., of any DESIRED CAPACITY.

WATER JACKET SMELTING FURNACES

For COPPER and ARGENTIFEROUS LEAD ores of NEW and ORIGINAL DESIGNS, covered by LETTERS PATENT. No other Furnace CAN COMPARE with these for DURABILITY, and in CAPACITY for uninterrupted work: MORE THAN 150 of them are now RUNNING in various parts of THIS COUNTRY, as well as many in FOREIGN COUNTRIES, giving results NEVER BEFORE ATTAINED as regards CONTINUOUS running, ECONOMY of fuel, AMOUNT and QUALITY of BULLION produced. These CLAIMS have been PROVEN BY RESULTS in ANY NUMBER of INSTANCES, and the GREAT SUPERIORITY of this SYSTEM of smelting ores DEMONSTRATED BEYOND QUESTION. COMPLETE PLANTS furnished to order of any CAPACITY, with ALL IMPROVEMENTS that experience has DEMONSTRATED as VALUABLE in this class of work.

WATER JACKET SMELTING FURNACES

THE DUNCAN CONCENTRATOR

Beyond question the cheapest and most effective machine of the kind now in use adapted to all grades and classes of ores.

This machine has been THOROUGHLY TESTED for the past TWO YEARS, under a GREAT VARIETY of CONDITIONS, giving most EXTRAORDINARY results FAR IN ADVANCE of anything EVER BEFORE REALIZED. A recent COMPETITIVE TEST at the Carlisle Mine in Mexico, showed an ADVANTAGE OF OVER 30 PER CENT in favor of THE DUNCAN. The amount SAVED OVER THE FRUE being sufficient to PAY THE ENTIRE COST of the machines EVERY MONTH OF THE YEAR. One of its MOST VALUABLE features is as an AMALGAMATOR. It saves all THE AMALGAM GOLD and SILVER that ESCAPES the BATTERIES, PANS or SETTLERS, making the machine worth MORE than ITS COST for THIS PURPOSE ALONE.

HOISTING WORKS

Of late and improved design with all known appliances for safety and efficiency to work to any depth and of any desired capacity. Complete shaft equipment, such as safety cages, landing dogs, cars, turn-tables, ore and water buckets, skips, etc., etc., for either vertical or incline shafts.

PUMPING MACHINERY

Adapted to all Requirements.

HOISTING WORKS

DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half year ending December 31, 1884, the Board of Directors of the German Savings and Loan Society has declared a dividend on term deposits at the rate of four and thirty-two one-hundredths (4 32 100) per cent per annum, and on ordinary deposits at the rate of three and six-tenths (3 6 10) per cent per annum, and payable on and after the 2d day of January, 1885. By order

GEO. LETTE, Secretary.

DIVIDEND NOTICE.

Plymouth Consolidated Gold Mining Company, No. 23 Nassau street, New York Jan. 5, 1885.

DIVIDEND No. 20.—The Board of Trustees of this Company have this day declared the regular monthly dividend of fifty thousand dollars, being one per cent on the capital stock, or fifty cents per share, payable on January 9, 1885. W. VAN NORDEN, President.

HEALD'S BUSINESS COLLEGE, 24 Post St. S. F. Send for Circular.

D. J. STAPLES, Pres't. ALPHEUS BULL, V.-Pres't. INSURE IN THE WILLIAM J. DUTTON, Sec'y. E. W. CARPENTER, Ass't Sec'y. N. T. JAMES, Marine Secretary.

FIREMANS FUND

INSURANCE COMPANY OF CALIFORNIA.

Assets Dec. 31, 1884, $1,520,894.77
Losses Paid, Over $5,500,000.00

CASH ASSETS, INCOME AND NET SURPLUS, LARGEST OF ALL THE COMPANIES ORGANIZED WEST OF NEW YORK STATE.

By charging Adequate Rates for its Policies, it is enabled to furnish Solid Indemnity to its patrons. It has but about one-third as much at risk in San Francisco, in proportion to assets, as the average of the other home companies, and its popularity is attested by the fact that it does the Largest Business on the Pacific Coast of any Company, American or Foreign.

HOME OFFICE: S. W. Cor. California and Sansome Sts., San Francisco.
AGENTS IN ALL PRINCIPAL LOCALITIES.

ASSESSMENT NOTICE.

Fremont Mining and Milling Company.—

Location of principal place of business, San Francisco, Cal. Location of works, Amador county, near Drytown, Cal.

NOTICE is hereby given that at a meeting of the Trustees, held on the twenty ninth day of December, 1884, an assessment (No. 1) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, No. 402 Front street, room 8, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the fourth day of February, 1885, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday the twenty-seventh day of February, 1885, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

MARK T. ASHBY, Sec'y.

OFFICE—No. 402 Front St., Room 8, San Francisco, Cal.

California Inventors Should consult DEWEY & CO. AMERICAN AND FOREIGN PATENT SOLICITORS, for obtaining Patents and Caveats. Established in 1860. Their long experience as journalists and large practice as Patent attorneys enables them to offer Pacific Coast Inventors far better service than they can obtain elsewhere. Send for free circulars of information. Office of the MINING AND SCIENTIFIC PRESS and PACIFIC RURAL PRESS, No. 269 Market St., S. F. Elevator 12 Front St

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, FEBRUARY 7, 1885.

VOLUME XLXX. Number 6.

Smelting Furnaces.

Within the last few years the production of iron and of the metals generally, by a given furnace-plant, has been largely increased, in many instances trebled. Iron-furnaces exceeding 100 tons' capacity per diem are now the rule in new constructions. Copper and lead furnaces smelting from 60 to 100 tons of ore per day are common. With this greatly augmented product, the life of furnace-linings has been diminished, and recourse has been had to various cooling devices for prolonging the life of such linings. The most recent improvement is that patented by Arthur F. Wendt, of New York City, and described him in a paper read before the American Institute of Mining Engineers.

The common course of projecting water against the exterior of the brickwork of a furnace has been in a large measure abandoned by our most progressive managers. All have recognized the danger of this proceeding, especially when applied to the crucible of a furnace below the line of the tuyeres. Cast-iron water-jackets, with wrought-iron pipes for circulating the cooling water, have replaced the cruder methods. In iron-smelting the use of such jackets has been confined to the crucible and the space around the tuyeres; and it has been the custom to support the jackets on the brickwork of the furnace. But the erosion of the brickwork below tuyere-jackets allows them to sag, and often displaces the alignment of the tuyeres and leads to other annoyances.

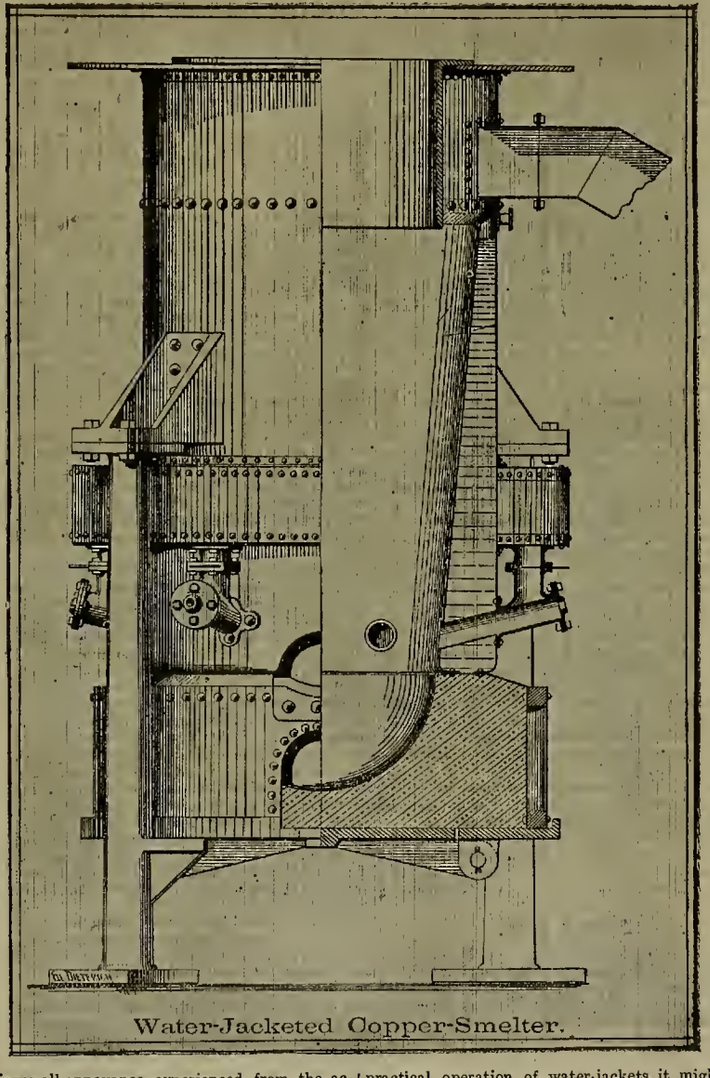
The principle of construction adopted by Mr. Wendt to remedy this and other evils, is to use a thin fire-brick lining (not over nine inches) from the tuyeres up to the bosh, to back this lining with wrought-iron or steel water-jackets, *hung* from the mantel-ring, and thus to carry the whole weight of the furnace and its filling upon the supporting pillars. The crucible proper is lined with three or four thicknesses of fire-brick on the sides, and not less than 48 inches in the bottom. It is supported on independent pillars, and is practically an independent structure. It could even be placed on wheels and made removable, were there any adequate advantages to be gained by such an arrangement.

An essential point in the construction is the annular space left between the jackets through which the interior of the crucible can be reached, and the crucible-lining can be repaired without blowing out the furnace. It is immediately below the water jacket that the cutting action of the molten cinder is the greatest; it is this space that can be most readily reached from the outside. From the bosh to the tunnel head the furnace presents no novelties. Above the brick work of the tunnel head the construction is entirely of iron, and differs widely from that usually adopted.

There are two floors supported by brackets attached to the shell of the furnace. Resting on the lower floors are heavy iron columns supporting the dome. Closing the space between the columns are thin cast plates, firmly keyed to the columns. It is against these plates that the stock strikes, upon the lowering of the bell, thus effectually preventing the wear of the brick lining near the tunnel head.

The charging hopper hangs from the charging floor, and its lower edge overlaps and rests on the circular angle-piece. This angle-piece is turned true, and makes a gas tight joint with the bell. It is cast in three or more flanged segments, which are bolted together and keyed fast to the top of the dome. If the angle-piece is chipped off or otherwise destroyed, the segments can be replaced.

Should the furnace be blown out the plates are removed, the hopper is filled with water, and a spray of water is kept on the dome. In smelting ores of iron, copper or lead containing an appreciable amount of zinc, an iron top replaces all annoyance experienced from the accumulation of cadmia. The zinc condenses against the iron, and can be removed without trouble. As stated, this description applies to the blast furnace with bosh water-jacket and iron top, for iron ores.



Water-Jacketed Copper-Smelter.

Since the writing of the foregoing, an iron-furnace to which Mr. Wendt had applied the water-jacket, has been blown out. The brickwork on the jacket is from six to nine inches thick, and the furnace has there preserved its shape. The bosh has a smooth surface and no re-lining is required. Above the bosh the lining has been cut irregularly. Around the tuyeres no brick-lining remains; and the furnace has been running on a slag-lining.

The engraving on this page shows the general arrangement of a 36-inch water-jacket copper-smelter of the type now common throughout the West, arranged according to Mr. Wendt's improvement. No lining whatever is used in the shell. The crucible is built up of fire-clay, rammed into place. The bottom of the furnace can be dropped, as is usual with iron cupolas. Lead furnaces are constructed on the same general plan.

To iron-masters not acquainted with the practical operation of water-jackets, it might seem by their use a large loss of heat is occasioned. But this cannot be the case, as a little reflection will readily prove. The bosh of an iron furnace, especially that part immediately around the tuyeres, invariable cuts out, sometimes within a few days after going into blast, until the lining has become very thin, and the tendency of the heat to destroy the material is checked by the loss of heat by conduction and radiation from this material itself. Now, whether this loss of heat is conditioned by the surrounding air, or is controlled by a circulation of water, can make no difference in the fuel-consumption. To preserve a certain thickness of brick, a certain number of heat-units must be carried off.

The smelting process, however, goes on much more uniformly in a water-jacket, which preserves the shape originally given to the interior, than in a furnace with thick walls cut into irregular shape by the heated stock and cinder. Thus, an actual saving of fuel may ensue.

The principle of construction described can be readily applied to many existing furnaces, by raising them bodily and replacing the old-fashioned, short pillars, under the mantel-ring, with long wrought-iron ones.

Quartz Mines near Downieville.

The northern counties of this State are now attracting considerable attention among mining people, some of the mines there having recently made good records. Moreover, there are many promising ones which only need further development to prove good properties. The results achieved by a few men have had the effect of causing others to look in the same direction for new mines, and we expect to see this year quite a revival of the mining interests of Northern California. The following notes refer to two of the promising quartz mines near Downieville, Sierra county.

The Junction and Slug Canyon quartz mine is located about a mile and three-quarters up Slug canyon, near the junction with Mt. Vermont canyon, at which point is situated the 8-stamp mill, where four men are employed—day and night shift. The incline, 444 feet long, extends to the blacksmith shop, where the cars loaded with ore are rolled out from the mouth of the tunnel, 50 feet distant, around a sharp curve. The weight of the loaded cars going down draw the empty ones up the incline. John Skemo is underground foreman. Fourteen men are employed pushing the lower tunnel ahead and stoping. Length of lower tunnel, 167 feet. John Berry, of Nevada City, is amalgamator at the mill, and Jerome York feeder. Wm. Allen is blacksmith. A Pelton wheel within two inches of six feet in diameter, of a pressure of 227 feet, requiring 18 miner's inches of water to run the stamps. The water is brought in through two flumes from Slug and Mt. Vernon canyons. The ledge is at an altitude of about 1,000 feet above Downieville, and 4,000 from sea level. The batteries at the mill have not yet been cleaned up, but before the mill was built Mr. York, the original owner of this property, with his arastra obtained an average of $11 per ton. The ledge was struck 80 feet in from the mouth of the tunnel. The present width of the ledge in the lower tunnel is from 15 inches to two feet, and from two feet to seven feet in the upper tunnel. Stoping in the lower tunnel is expected to find the extension of the large chimney above. Giant powder is used. Considerable water is running out of the tunnels; ore prospects rich everywhere. The best of silver plates from San Francisco are used at the mill. F. E. Allen, out here about three months from Chicago, is general manager for the present owners, Cross and Simmonds, of of Nevada City. A large amount of cropping on surface.

The main tunnel at the Forest Queen, Dr. F. M. Bibsr's quartz mine, three-quarters of a mile up Slug canyon, above Downisville, is in 120 feet, blasted through red serpentine with giant powder, striking the ledge between slate and serpentine. Ore prospects $25 per ton; width of ledge about four feet. A. N. Whitelaw and Geo. Freis are developing the property for the owners.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS

The Mineral Belt of Amador County—No. 5.

EDITORS PRESS:—The Hardenburgh mine lies just above Middle Bar, with a 20-stamp mill at Middle Bar, which has been idle some years. From the men that worked in this mine I learn that no better mine is in this county if properly worked by capitalists. There is a shaft of 500 feet on the ledge, with four or five levels of 100 feet apart and from 100 to 200 feet each in length. Good paying quartz was taken out of this mine from the very top all the way down to the 500-foot level, and it run from $5 to $10 and $15 per ton. There is also a good water ditch of 1,000 or more miner's inches of water and two and one-half miles long, that belongs to this property, which is owned by General Hardenhurgh, of San Francisco, California. Some $60,000 has been taken out of this mine. The ledge runs from 5 to 30 or more feet in width, and there is at least a big fortune for the parties who will take hold of and develop and work this mine again, as it is considered by all who have worked in it second to no quartz mine in Amador county to-day. I know of no better interest than this old Hardenhurgh mine at Middle Bar, but I understand that General Hardenhurgh does not intend himself to work it, though I believe he will sell it to parties who will work it in a proper manner, as half a million dollars of quartz is in sight to-day.

The next quartz mine one-half a mile north of the rich Amador Queen mine, of Shugart & Morgan, is the

Moor Mine,

Which has a good ten-stamp mill, and two Frue concentrators, that are, like the mill, as good as new. This was the old Howard mine and ranch, one mile south of Jackson, and one-half a mile south of the rich Zeile mines and mills near Jackson. Two or three shafts from 100 to 200 feet each, are upon this mine, with good hoisting works and buildings over them. The elder Howard died some years ago, and the younger brother died over one year ago here. Since the death of the first Howard, this property has been in litigation, but within a few weeks past, parties have bought this mine and the farm with it, and they will start up this mine and mill that during its working years proved so rich that it is considered the equal of the best of Amador county quartz mines. A good, wide quartz lead, well defined and with plenty of paying ore at hand, must make these joint owners a handsome, and a good-paying property, and they have the money to develop and work it in a proper manner. The next is the

Zeile Mine

At Jackson, with its forty-stamp mill, large concentrating works for sulphates, and one of the finest hoisting works, and everything else about the mine second to no mine and mill in California. They crush 130 to 135 tons of ore every day, and employ 135 men steadily. There are six or eight other good rich quartz mines at and close to the town of Jackson, any and every one of which will, when taken hold of and worked with $100,000 or more, of capital, and in a proper manner, pay as richly and prove as large "bonanza gold quartz mines" as any of the mines that I have mentioned in these communications or as any other mines in Amador county. Some of them are covered by quartz patents, others of them are held under agricultural patents. All that monied men have to do is to buy their farms or ranches and then they get both the farms and these quartz mines also with them, as the first owners are not able to develop and work them, or else they do not care about doing so, but would rather work their farms. The village of Jackson, which is the county seat of Amador county, has a population of 2,000. I will also state that there are many

Good and Large Ranches

Joining this three miles of quartz mines from 150 to 1,500 acres each. Dr. Chambers owns the first farm of 160 acres next to the rich Nevills mammoth quartz mine, which is one of the best and richest of soil ranches for grain, hay, grapes and all kinds of fruit to be found in the county of Amador. Besides it is one of the most beautiful places to reside in all the county. No frosts, ice-frozen ground or snow here. This place lies upon the main traveled road to the Nevills mine and Middle Bar, and which is the levelest and best road and drive as far as Belle Monte ranch and cottage, that leads out of Jackson in any direction. When the Doctor gets his farm opened up and fully improved, with the natural grove of alpine and other ornamental and evergreen shade trees that surround his cottage, one may well be content to "live and die" in such a home and climate as this. But a wife is wanting to make this home and place complete, which Dr. C. has not got, I believe.

The next ranch that joins Dr. Chambers is "Zack" Kirkwood's, as he is called here and is one of the largest and best worked places in the county and has 800 acres of good land well fenced and good large sheds and barns upon it with some three houses or more. Mr. Kirkwood also owns some 400 or 500 acres up in the mountains 60 miles east of here, where he drives his cattle in the summer months to graze and range there until the rainy season begins, when he returns home again. He has between 200 and 300 head of cattle and about that many hogs with, some 50 head of horses on his ranch and puts up 150 to 250 tons of hay each year. He also raises hundreds of chickens and turkeys and makes large amounts of butter while up in the mountain range with his cows and cattle. Any one that has spent a few weeks up in these mountains at "Silver Lake" where Zack Kirkwood's ranch and summer hotel is located, knows well both Zack and his good lady, who presides over the hotel at Silver Lake in the summer season. In fact to not know Zack Kirkwood in this section of the county is the exception and not the rule.

Next joining "Kirkwood's" is the large and good ranch of Mr. Raymond. This is one of the largest and best ranches and stock farms as well as wheat and barley ranches in this county. Mr. Raymond is of French descent and one of the best farmers and citizens in Amador county; he is an old "'49er," his house is large and connects with a fine wine vault and cellar, large barns and sheds for 1,500 sheep, which is his average flock. He has several hundred head of hogs and cattle, a fine vineyard of choice grapes, and a small good orchard of fruits. He has 1,300 acres here and 300 or 400 acres well up in the mountains as a sheep and cattle range, where he drives his sheep and stock each summer to graze. Mr. Raymond raises each year from 10 to 20 tons of grain of the finest quality upon his ranch.

Next to Mr. Raymond's is the large ranch of Mr. Jackamin's of 1,300 acres. He is also hay, cattle and hog ranchman and amongst our heavy farmers and hardest workers.

Next to Messrs. Kirkwood's and Jackamin's is the largest of all our ranches of about 2,000 acres. This perhaps the very best improved and worked ranch in this part of Amador County. This is owned and worked by "Italian John" (John Bellwomary). He has over 100 head of fine horses with 400 or 500 head of cattle and several hundred head of hogs. Like all the farmers hereabout, he has large summer stock ranges up in the mountains. There are five or six dwelling houses, and barns and large cattle and hay sheds, upon this fine ranch. They put up 300 or 400 tons of hay each year. James Badracco has a ranch of some 400 acres that joins Mr. Kirkwood's and "Italian John's" ranch; this is also a good ranch and Mr. Badracco put up over 100 tons of hay besides raising wheat and barley and has 100 head of good cattle, hogs, etc. upon his place. All of their farms keep chickens and turkeys, and put up butter and cheese yearly. Next is the ranch of the Messrs. Holtz, which joins with Badracco ranch and the ranch of Dr. Chambers.

Now, the reason why I have given some of these rich farms and ranches in detail, is to show Eastern monied men, who may wish to put some of their spare money or capital into these rich gold quartz mines here in little Amador county, that hay, grain, butter, beef and horses, with mutton and eggs, chickens, fruits and vegetables are here, raised and produced right at home and close to the quartz mines. All these things are here to be had from those who produce and raise them, fresh and cheap, and not at a fabulously big price, for all these articles of living must be had at and with the working of all gold or silver mines anywhere. No matter at what cost or price, they must have all these things; hence, as I before stated in these articles, the gold quartz mines and leads of little Amador county, California, can be worked at the least cost for everything, and not at the big prices that must be paid for all those articles, 1,000 miles away from civilization and farms. There are good hotels at Jackson, of which the National Hotel, owned and run by Messrs. Evans & Askey, is first-class in every respect, and second to nothing of the kind in the interior of California, and Ginochio & Bro. and others keep very heavy stocks of all kinds of goods—iron, lumber, grain, hardwood, grains, dry goods, etc., equal to any stores in the interior of California. WELLINGTON.

Arizona Mines.

The Prescott *Courier*, in speaking of the mining situation in Arizona says: Mines which have been worked are mostly copper, and as this metal has not been in great demand, we cannot say that the copper mining industry has paid very well. The Clip silver mine, of Yuma county, some mines in Mohave, the Silver King, of Pinal, the Dosoris, Lane and other mines of this county have paid well. Of gold mines but little is to be said. Gold, here, is hidden away in sulphurets which have not been successfully treated. It would take pages of this paper to give names of veins of this Territory which carry gold, silver, copper, lead and other metals. Of course no one supposes that all these veins can be made to pay. Some of them are mines; others prospects, and a great many of them no good. The mining fields of the Territory are many; they are also large. As yet but little prospecting has been done in them, so that in the good time that is coming ledges, which are now covered up, will be unearthed and prove to be the richest in the Territory. The Vulture gold mine had few, if any, equals, as a large bullion producer. Its end is not yet. We must have more capital; cheaper transportation; cheaper supplies of all kinds before we can place the Territory at the head of bullion producing States and Territories, where we firmly believe she will eventually climb. North and south railroads would enable people to pierce our mining fields; would reduce prices of living here, and of course, give an impetus to mining, the pleasing shock of which would be felt all over the Republic.

Utilizing of Waste Material.

In the beneficent economy of nature, there is nothing lost, nothing thrown away. What seems like waste is only a form of economy we do not understand. In the autumn there are tokens of decay. The flowers fade, the grass withers, the leaves fall, as though Nature was dropping her head in prayer before sleep. But we know that in the midst of all this decay there has not been a particle of waste; that not one grass-blade or leaf has lived in vain; that not one undeveloped plant or fruitless seed has been destroyed. They all slip into the hidden and mysterious receptacles of nature, and in due time come forth in new forms and use.

Man has taken the hint of economy that nature kindly gives. Within the past few years important progress has been made in the industries of the world, but nowhere has this advance been more marked than in the utilization of waste material.

From a paper read before the London Society of Arts, by P. L. Simmonds, we gather some facts which we believe will be interesting to the readers of the RURAL as an illustration of the way science is contributing to the thrift and domestic economy of the world. The beautiful aniline dyes produced from the tar of gas works and the sugar from beet root are noteworthy examples of the utilization of what was once thrown away. The wool manufactures of nearly all countries now use up cuttings of cloth and shreds of all kinds which were not long since swept out and burned as useless, and the strippings and refuse of cording are now considered next in value to pure wool, and contribute no mean sum to the nation's wealth. Silk waste, which at one time was thought to be of no value, is now converted into a material called floss silk. By silk waste is meant the outside and inside husks of the cocoons, pierced cocoons that have been eaten through by the moths, and in fact every portion of silk that is not available for working up into fine silk fabrics or thread. The refuse of tanneries, which consists of untanned dried pelt or glue pieces, fleshings, hair, lime deposit and spent tan, is now profitably utilized. Ordinary size is made from the refuse of the hide and is used by paper hangers, cotton spinners and carpet manufacturers. The so-called cheap sealskin leather is made from common plasterer's hair—of that obtained from the tan-pits. Cardboard, printing paper and roofing boards are made of the waste bark from the tanneries. Artificial leather, made from leather scraps, is extensively used. A valuable article in the shape of a new black is obtained from the same source, and is largely used in the manufacture of printing ink, dark pigments and blacking, taking the place of bone-black, and is sold at one-third of the price.

The blood from slaughter-houses is now made into blood albumen, and the drainings and clots go for fertilizers. Among the animal substances now utilized are many species of fish skins, alligator, crocodile, and even snake skins, which are tanned and made into innumerable articles of every-day use. Of the vegetable substances, none are more commonly used than those which enter into the composition of paper. Wood of long fiber, bamboo, cactus, esparto grass, the butt ends of jute, the refuse stalks of the sugar cane, the husks of oats, barley, rye and rice, are all used for this purpose. The waste paper of Government offices and the spoiled impressions in printing establishments, which were once the perquisite of messengers and office boys, are no longer considered beneath the notice of the Government or the richest publisher, since it has been discovered that they may be remade into very good paper and used again.

It is only since 1860 that the extraction of oil from cotton seed has become a commercial staple. The oil and oil-cake is now often of more value to the planter than the cotton fiber. Glucose is a new use for maize, which was discovered in 1867. Since that time its manufacture has steadily increased, until now it is stated by the New York Chamber of Commerce that its production in the United States is not less than 1,000 tons a day; but many of the uses made of this material are decidedly objectionable. Corn cobs are found to contain potash, and by the aid of chemistry promise to become a new mine of wealth. It is only 20 years since glycerine, a by-product in the manufacture of soap and candles, was considered worthless; now it would be difficult to enumerate all the uses to which it is applied.

Among the items of mineral waste now made use of is the tin dust, which is really the scum from the tin pot, and which is now separated from the waste and used for button making and various other purposes. Pyrites, formerly a neglected mineral, is now made to yield sulphur. The waste of glass furnaces is used again, serving a purpose in the manufacture of glass, similar to rags in paper making. Broken bottles, though when remelted make an inferior quality of glass, still it is used for many purposes and finds a ready market. It is also made into cheap jewelry, mantel ornaments, and the like. The utilization of slag from blast furnaces is not new. It has long been used for road making, but science has found a way to convert it into bricks and other useful building material. It is also applied to the manufacture of artificial stone and molded into chimney pieces, window-heads, balustrades, and outside ornamental work generally. It is also used in making mortar, cement and concrete. Another application is the manufacture of slag-wool. By the action of strong jets of steam, the slag is transformed into a fibrous, whitish silicate cotton, which, being mineral, is incombustible, like asbestos, and is now extensively used in the construction of new houses with mansard roofs, the space between the interior lath or paneling, and the exterior covering of zinc, slate or tin, being filled with this slag-wool, which protects from the rigor of frost in the winter and intense heat of the summer. If in winter taps and spouts and water-pipes are covered with this slag-wool, it prevents freezing and bursting, and is going extensively into use in cold climates, to the great discomfiture of the plumber's business.

The Silver King.

In our annual mining review last week, reference was made to the famous Silver King mine, in Arizona. The facilities at this mine are being extended. During the last year the surface improvements at the mine have been as follows: The erection of a small store-house for iron and steel; the extension of blacksmith shop 15 feet; the widening of engine-house 11 feet, for new machinery; the construction of a new entrance road to the premises for the ore teams; and the reconstruction of the engine-room which contains the engine furnishing power to the shops. Two new 54 inch by 16 feet steel boilers, supplying 100 horse-power additional power, have been set up adjoining an old steel boiler of the same dimensions, thus giving in the battery of three, nominally 150 horse-power, and at present steam requirements allowing a relief boiler to contend with the scaling water. A single 18 by 30-inch Ingersoll air compressor has been set in place, and furnishes power for seven air drills in the mine, and at the same time additional ventilation, while its capacity is sufficient to run three or four more air drills, or a diamond drill of about 15 horse-power.

As this is a representative Arizona silver mine, some of the details of the operations of last year will be of interest. We take this from official reports:

The consumption of cord wood at the mine was 1,303 cords, costing $12,297. The average consumption the first six months of the year was 2 3-10 cords per day, while that of the last six months has been 4 82-100 cords per day, the increased rate being due to the increased steam requirements. On the first of August the price was reduced $1 per cord.

The improvements during the year at the Company's mill have been the introduction of the Brush and Swan systems of electric lighting, the former with excellent results; the erection of a substantial masonry pump house over the 6-inch drilled well, to replace the one destroyed by last winter's flood, the construction of a low masonry dam, 80 feet long, across Queen creek, that advantage may be had of all the water that flows in the bed of that stream.

The amount of ore hauled to the mill was 20,570 tons, and the year opened with a reserve in the mill yard. The total amount of ore crushed was 22,342 tons, which has yielded 51 shipments of concentrations, averaging about 11½ tons each, and aggregating 577 98-100 tons. The ore shipped was about 2 59-100 per cent of that crushed, the charge in this ratio being due to the character of ore met with in certain parts of the 700 level in the early months of the year. The average assay of the ore, as per daily assays, was $43 12, and that of the tailings, similarly obtained, was $5.65. Of the silver contents of the concentration, 50 9 10 per cent was in the form of ductile or native silver, and 49 1-10 per cent, as contained silver in the various argentiferous minerals. The consumption of cord wood at the mill averaged 6 1-10 cords per day, at a cost of $9 per cord.

In the early part of last May, the milling facilities were increased by leasing the five-stamp amalgamating mill of the Windsor Con. Mining Co. Since then the mill has been run on our quartzose-haratic ore, of which we have large quantities in the 500, 600 and 700 levels of the mine, and which cannot be advantageously concentrated. The ore is dry-crushed, roast-chloridized and amalgamated. Eighteen hundred and nine and sixty-two one-hundredths tons have been crushed and treated, having an average value of $46.38 per ton. The average value of the tailings to the close of the year was $9.33, but up to the fore part of December was much less than that figure, the proportionate increase being due to mechanical causes, chiefly the inability to set new mullers and shoes in the pans on account of delays in freighting from bad roads. The chlorination is satisfactorily effected with 2¾ per cent of salt, and the average consumption of quicksilver per ton of ore treated was 1 32-100 pounds. The consumption of cord wood is four cords per day, at $9 per cord. The chloridized ore is readily amalgamated, and the process of treatment has worked satisfactorily, and can be applied successfully to any class of ore at present known to exist in our reserves in the mine.

MECHANICAL PROGRESS.

The Age of Steel.

Wonderful progress has been made of late in the adaptation of Bessemer steel to uses to which iron only was considered applicable. At the office of the North Chicago Rolling Mill company was recently shown specimens of steel wrought into several shapes requiring great ductility—bars of various dimensions twisted into coils, and even fine wire spun out of the product of the same furnace from which come the inflexible steel bars of our railway tracks.

Steel Tacks.

The substitution of steel for iron in the manufacture of nails and tacks is regarded with much interest, the claim being made by some that it is likely to revolutionize the manufacture of tacks as well as nails. The American Tack Company, Fairhaven, Mass., have commenced the manufacture of the steel carpet tacks, for which claims are made as a superior article, having advantages over the common iron carpet tacks. It is claimed that the steel tacks will not cripple in driving, and, on account of the toughness of the material, that the heads will not come off when drawn out. They are sold at 37½ cents per dozen papers for Blued, and 50 cents per dozen papers for Tinned, subject to the usual cash discount, making the net cost less than 1½ cents a paper at wholesale.

The Age of Iron

Is fast giving place to the age of steel. Science and inventive genius have found how to diminish the cost and at the same time increase the durability of many manufactured forms by substituting the rapid process of Bessemer for the slow operation of puddling by hand.

A Foolish Opposition.

The puddlers, who have, on account of the difficulty and toilsome nature of their art, long controlled the price of their labor and thus regulated the price of iron, have taken alarm at the rapid inroads of steel, and are endeavoring to "boycott" manufacturers and purchasers into the production and use of iron made by the old method. This is short-sighted and unwise. If steel is better than iron for various uses it will surely take its place, and no industrial combination can prevent it. But the progress of the inventive arts has never resulted in reducing the general demand for labor. On the contrary, it has greatly stimulated it by creating new wants and organizing new industries to meet them. The drivers of stage coaches fifty years ago saw ruin impending if the steam locomotive was introduced, but the locomotive came nevertheless, and the railways of England now employ a great army of workers, and have vastly increased the opportunities for employment opened to the laboring man. If the puddling process is to become obsolete, work of a better, less exhausting and more satisfactory nature will take its place. There will still be bread enough for all industrious men, and occupations by which to obtain it. But labor combinations cannot hold back the car of industrial and scientific improvement.

A PAPER MAN-OF-WAR.—It could hardly be credited that there is already in existence paper men-of-war of large tonnage. A few years ago, says a correspondent of the *American Queen*, I was on board the British man-of-war, the Raleigh, which was cruising in East Indian waters. Pointing to the substantial-looking wooden walls of the vessel, a midshipman asked me one day if I knew what those were made of. I answered that probably they were made of teak or oak, and was considerably surprised when he laughed and told me I was all at sea in more senses than one. "The hull of the Raleigh," he said, "is really paper hydraulically pressed. Paper walls, in place of the famous wooden walls of England that the poets sing about, were adopted by the admiralty a few years ago as an experiment on a few men-of-war. This is one of them that you are now sailing in through the Indian Ocean." The paper hull idea, as applied to men-of-war, is a good one, at least in theory. In the old wooden and iron ships, men were more exposed to danger from splinters than direct missiles. Now, paper hulls would at least do away with splintering. A shot might hit a vessel and pass right through its side, but the hole would be a clean one, and there would be no splinters until the missile encountered some of the internal machinery and compartments. I do not know whether the English Government has built many of these angular paper boats, but it had one of them at least, in the shape of the Raleigh.

A NEW CONSUMPTION FOR STEEL.—The working of sheet steel into forms or shapes in the United States is comparatively new and but little understood. A short time since Mr. Brown, of Brown & Brothers, interested a large and enterprising steel producer of the west to make uniform and ductile metal that could be wrought cold like copper, into seamless shells, cylinders, boilers and tubes, which in cost compare favorably with riveted galvanized-iron work. For receivers of all kinds, where hard usage is to be expected, and for steam and kitchen boilers, where strength and durability are demanded, they are said to be perfection. The riveted house-range boiler is an instance of a construction in which constant expansion and contraction soon work destruction by leakage, and which only stands a hydraulic pressure of 180 pounds. A seamless-steel boiler is not affected by expansion or contraction, stands a hydraulic pressure of 600 pounds, and is smooth and symmetrical in form and finish. The steel is protected against oxidation by a new treatment, by which a white alloy is distributed over the surface. The new product is called "silvercid steel."

CHIMNEYS.—A soundly-built chimney vibrates, or swings from side to side, as a whole, under sudden and violent shocks of wind, and is in reality safer when it does so than when it stands in sullen and unmoved resistance. The vibration indicates that the several constituent parts of the structure are firmly compacted into one coherent, continuous, and, as it were, homogeneous mass, which can sway from side to side like a steel rod or spring, without any tendency to dissolve its continuity and break asunder at some intermediate point. The absence of vibration, on the other hand, means that there is not this integrity of cohereace, and that there are, so to speak, fissures of substantial continuity in the structure, at which disruptive strain is unavoidably developed. Sudden shocks of wind bursting upon lofty columns of brick-work in such circumstances tend to break them across at the joints where the interruption of continuity occurs. The movements of vibration are there absorbed, and converted into the less desirable condition of molecular strain.

PRIZES FOR INVENTORS.—A member of the French Legislature has proposed a prize of $1,000 each for the best essays by inventors on several important subjects, to which a good deal of attention has already been paid in Europe, as well as here. One of these prizes is to be for a practical method of producing aluminum at a low cost, a field in which many times the proposed prize has been expended, and which has been the object of special research by eminent scientists. All but one of the systems for its production now require the use of sodium, itself an expensive metal, and the Jablochkoff system for its production by electricity is also costly. Another proposed subject of one of the prizes is a simple small motive power, for this best style of which so many inventors have long been striving. The individual who should succeed in obtaining the results desired by this "generous" offer would hardly be liberal enough to donate it to the world for the prize offered, so long as the patent laws, in France, as well as here, would render his discovery worth many hundred, if not many thousand times more.

PHOSPHORIZING WIRE.—A method of phosphorizing bronze or brass wire followed by some manufacturers is the following: The wire is put in a solution of from one-eighth to 5 per cent of phosphorus in either, bi-sulphide of carbon or olive oil, 5 to 10 per cent of sulphuric acid and 85 to 95 per cent of water. In this bath the wire remains till the metal begins to take up the phosphorus. The wire is then drawn to one number finer and placed in a closed retort with a thin layer of phosphorous, so that the phosphorous vapor may spread over the surface of the wire. After this the wire is packed in charcoal, which is kindled, and after proper annealing the wire is again drawn to a finer number. This process is repeated till the required fineness is obtained. Wire so phosphorized is very tough, takes a high polish and does not easily corrode.

THE REPUTATION OF AMERICAN machinery has not only been sustained in recent years but has been extended to remote parts of the world. The Philadelphia *Press* says that a prospector sent out some months ago by the Russian Government with the object of gaining information relative to mines and mining to be made available in the working of the mines of Siberia, has, after visiting many mining districts in this country and Europe, advised his government to purchase American machinery and to adopt a very large number of the improvements in which, he says, American miners excel. The machinery purchased will be shipped from San Francisco to the mouth of the Amoor river, from whence it will be transported an average distance of 2,000 miles into the interior of Siberia.

UNDERGROUND SHAFTING.—The transmission of power by underground shafting is a system which is steadily increasing in public estimation. In several new industrial enterprises in this country the system is employed. At Pullman, Ill., a shaft of sufficient size, geared to the shaft of the celebrated Corliss engine is laid in substantial masonry, extending northward and southward from the engine, and having gear at desired distances to transmit power to right-angled shafts as required. The Allen paper car-wheel works 1,000 feet north of the Corliss engine, are run in this way, as is the machine and blacksmith shop, while the shaft running eastward from the main shaft runs the immense pumps for the water works and to drive away the sewage.

PRESSED GLASS.—It is stated that pressed glass is turned out in the Siemens works, that is hard and tough as cast iron. It is far lighter and not affected by temperature, etc. It is intended to make out of this hard crystal, street lamp posts, stairs and gas and water pipes. It is thought these articles can be made 30 per cent cheaper than in cast iron, but will not, of course, be so heavy.

SCIENTIFIC PROGRESS.

The Waking Power.

An old problem of the psychologists has been revived by a letter to *La Nature*, written by a French business man who mentions that for years he has been in the habit of waking himself at any hour in the morning that he wished, simply by impressing upon his mind before going to sleep the fact that he must awake at that hour, and saying further that he seldom varies five minutes from this moment which he has assigned himself. The writer referred to says: We have a very distinct recollection of many instances in which we have ourselves tried the experiment with success, and at one time when it was necessary for a considerable period for us to wake on certain days of the week at a very early hour, to take the first train to the place where our services were then needed, we had an opportunity of studying the circumstances under which this peculiar species of self-control is most easily exercised.

Whatever part of our mind it might have been that took charge of waking us seemed to begin its count of the hours from this time at which we composed ourselves to sleep, and if we did not inform ourselves of this our conscious reckoning was correspondingly uncertain, and the effort to wake vague, but if we took a clear note of the time in the evening we could sleep peacefully through the whole of the allotted interval, sure of being aroused at or near its expiration.

Another condition of waking we found to be the occurrence of some small external event, through which, as it were, the internal effort could take effect upon our senses. A very trifling circumstance—the flutter of a leaf outside the window, the chirp of a bird or any other of the unnumbered sounds of early morning—was sufficient, if it happened at the right time, to wake us by a sort of magnifying process which at that moment gave the power of starting up by a noise which would at other times be unnoticed; but without such sensible impression we think we should not have waked. In fact, on one or two occasions we remember to have been impressed with a dim consciousness of waiting for something to happen before waking, and a moment later a trifling sound would open our senses with a little shock. To the necessity of waiting for this impression, small as it might be, we were disposed to attribute the variation of a minute or two, either way from the exact moment assigned for waking, which might otherwise be kept with exact punctuality.

Electricity in Cotton Mills.

One of the most formidable foes the cotton spinner has to contend with in working cotton fiber is electricity, which is generated with fearful rapidity in dry frosty weather in all parts of a cotton mill, by the friction of machinery and belts. This is especially the case on a dry November day, rather cool, with the wind ranging from north to northwest, when the electricity is very active and mischievous on cotton fiber.

In the process of spinning, when carefully observed with a magnifying glass, the fibers will be seen to be drawn out at right angles from the cotton, if in the process of drawing, and from the thread, if in the process of opening. These fibers are constantly swinging off at every conceivable angle, giving the thread of warp yarn a rough woolly surface, much like mule filling spun from a low grade of cotton, in which a short staple of cotton predominated.

These facts show most conclusively the importance of placing all drawing, roving and warp-spinning machinery in the most favorable positions, away from the influences of electricity. Careful experiments made to determine the injury wrought upon work by the influence of electricity, when no means are taken to draw it away, show a deterioration of from 4 to 5 per cent in strength of thread.

The *Textile Record*, from which we condense the above, says: With 65 per cent of moisture in the air and the temperature at about 75°, and with a northeast wind, the spinning and weaving in most of the New England mills will generally be found running well, provided the quality of the cotton and all other things are properly adapted to the numbers of the yarn spun.

Good electric-conducting insulated wires to convey the currents to the ground are essential to success in controlling the silent, subtle fluid, and in this way to destroy the bad effects of electricity on the quality of the work in cotton mills, without the serious objections to the use of cold vapor or hot steam in the rooms. Care should be exercised, in conveying the electricity to the ground, to have an unbroken connection of metal to the ground, so that the current shall not be severed. If the conducting wires are attached to sprinkler pipes, care should be taken to file off any rust or paint, so that the connection shall be made with clean polished surfaces of the wire and pipe together.

THE COLOR OF OZONE.—MM. Hautefeuille and Chappuis, have found that ozone is a blue gas, the color appearing sky-blue even when only so much ozone is present as is obtained in the ozonation of the oxygen contained in a tube a meter in length by the silent discharge. Furthermore, they found that under very great pressures the condensed gas became indigo blue. If the pressure is increased to 75 atmospheres, and then suddenly relieved, a dense, white cloud is formed, showing the beginning of liquefaction, while the same phenomenon does not take place with pure oxygen until a pressure of 300 atmospheres is attained. The ozone must be compressed slowly and with constant cooling, otherwise it will explode with evolution of heat and light. By mixing the ozone with carbon dioxide, and then submitting this mixture to great cold and pressure, Hautefeuille and Chappuis succeeded in obtaining a deep-blue liquid, the blue color being due to the liquified ozone. The same observers have studied the absorption spectrum of ozone, and accurate measurements of the same have been made by W. N. Hartley. The latter has extended this research to the absorption of certain parts of the sun's rays by atmospheric ozone. By this new optical method, he has arrived at the conclusions: (1) That ozone is a constant constituent of the upper atmosphere. (2) That it is present in larger amounts in the upper than in the lower part of the earth's atmosphere. (3) That it is the cause of the blue color of the sky.

RAIN WATER.—There is a notable difference in the character of rain water, even between the time in which it condenses into drops in the clouds and that of its reaching the earth. A cotemporary says: "The water which alights as rain is not the same as the water which existed in the cloud. That we must imagine to have been pure water, as it was when present as an invisible gas in the midst of the clear, blue air. This has already picked up many foreign ingredients also present in the air, through which the falling shower has passed. Like the mineral cloud in the midst of the glacier river, it has carried down with it all it could—more, indeed, than is possible for a cloud of mere triturated rock, like that which the Rhone brings down to the Lake of Geneva; for the rain drops possess not only the power of surface attraction, which is all that particles of rock exert—they are also solvents, and will take into solution all that is soluble in the air through which they pass. The air contains many soluble substances beside itself. All life, and still more death and decay, is always filling it with foreign substances which are soluble in water. Carbonic acid, the product both of respiration, and of putrefaction, is largely present in it. Ammonia is present in it. Nitric acid is present in it. Even the chlorine of common salt, thanks to our nearness to the sea, is present in it. The rain dissolves, absorbs and carries down all these things."

SCIENCE APPLIED TO PAINTINGS.—A new method of painting, or rather an old one, has been recently revived by an English painter and a French chemist, by which new paintings are made to exactly resemble old ones. The material used is colored wax, which is melted in metal palettes and put on the panel with a stiff brush. Then comes the really artistic part of the work, which is done with heated irons of peculiar form, copied from a recent discovery of old tools used by the ancients for the purpose, by which horn is blended with stone, and wonderfully rich and delicate effects are produced. That these wax paintings are permanent is sufficiently proved by the encaustic paintings which are preserved in the Louvre and the British Museum.

ALUMINUM FOIL.—Beaten aluminum leaf may now be obtained in books like silver leaf, and is largely used instead of silver for decorative purposes. Mr. Levison suggests heavy aluminum leaf as a substitute for tin-foil for coating Leyden jars and similar electrical apparatus. Area for area, it does not cost much more, is much lighter and permanently retains its polish. A book of 50 leaves of aluminum, of the ordinary thickness, costs 25 cents; of a thickness suitable for Leyden jars, 50 leaves, about 4 inches square, costs $1.

TELLURIC CURRENTS.—M. E. C. Blavier has brought before the Academy of Sciences a paper on "Telluric Currents." He shows that the variations of terrestrial magnetism are due to electric currents which circulate in the atmosphere at a greater or less distance from the ground, and the circuit of which is completed either directly when they encircle the entire globe or by the intervention of the earth, but at a depth sufficiently great to have no action on the magnetic needle.

THE HEAT OF THE SUN.—In the focus of a burning-glass the sun's rays will melt the most refractory substances. The heat, then, of the sun is most intense. If we were as near the sun as we are to the moon, the whole solid earth would melt away as wax. Were the sun surrounded by a coat of ice 50 miles thick, it would all be melted in one minute's time. One acre of the sun's heat supplies energy sufficient, if it were available, to run all the steam engines on the earth.

QUININE SUBSTITUTE FROM COAL.—A chemist in Munich has, it is stated, succeeded in obtaining from distilled coal a white crystalline powder, which, as far as regards its action on the human system, cannot be distinguished from quinine, except that it assimilates even more readily with the stomach. Its efficiency in reducing fever heat is represented as quite remarkable.

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SAN FRANCISCO:
Saturday Morning, Feb. 7, 1885.

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Passing Events.

The silver miners of the coast are now anxious to see what the result of the recent "silver convention" will he. The Denver convention finished its labors and adjourned *sine die*. We give elsewhere in thie numher of the PRESS the resolutions adopted. A convention was also held laet week at Carson, Nevada, when resolutions of a similar tenor were passed.

The low prices of lead and copper are having a bad effcct on mines in Montana, Arizona and Utah. The copper minere are in daily hopes that the market for their product will grow hetter. A movement is on foot hy an eastern syndicate to get possession of the great Montana copper mines, in which case, no douht, production will he restricted in hope of hettering prices.

Prospectors are lookiog forward eagerly to the openiog of epring, so that they may start out into the mountains again.

The Government has advised explorations of certain Alaskan rivers, and it may he that this will result in the finding of some new diggings, the regions in question never having heen prospected.

A BILL has been introduced into the Nevada Legislature for the organization of a State Mining Bureau, and calling for an appropriation of $1,000 for that purpose. Senator Smith, of Lander county, has introduced a hill into the Senate to reduce the maximum rate of fare over all roads in Nevada to five cents per mile.

TIN is said to have heen discovered in Ten Mile District, near Helena, M. T.

Copper in 1884.

The gradral hut very marked decrease in the price of copper during the year 1884, which was mainly dne to the greatly increased production of the United States, has had a depressing effect on copper mining in this country. The comparatively new coppsr producing regions of Montana and Arizona feel the depression most, as they are distant from the central copper markets and pay high freight rates. So low has the price been reduced that some of the mines will have to shut down until prices improve; the cost of production heing now harely paid at ruling market rates. The Lake Superior companies are trying to force the Montana and Arizona mines to diminish their production, and to this end recently made heavy contracts for delivery during the next five months, the purchasers heing precluded from supplying themselves with other American copper. The Arizona and Montana mines must necessarily export to Europe ths hulk of their product, where it must compete with that from Chile, formerly the largest copper producing region of the world, hut now second to the United States.

It is very gratifying to nots that the United States is now in a position, as far as copper production is concerned, to rule the markets, though we etill look to England to establish prices. For many years Chile has heen the greatest copper producer of the world, hut for the past two years America has taken the position, and will probahly keep it. It will he interesting to note our gradual growth in this respect as compared with Chile. The latter country exports practically all her copper, while we use a great deal of ours at home, so hy comparing the Chile exports to all countries with American production we can get at fair average results. The figures appended to shows the relative growth, therefore represent Chile exports and American product in tons fine.

Years.	Chil Tons.	United States. Tons.
1876.....	50,912	19,[illegible]
1877.....	45,562	23,000
1878.....	46,931	21,500
1879.....	49,560	23,000
1880.....	43,135	27,000
1881.....	38,160	32,000
1882.....	43,129	40,913
1883.....	41,229	52,000
18[illegible].....	43,700	70,000

The product of Chile and United States for 1884 is estimated. It will be seen that siocc the Arizona and Montaoa mines hegan producing, our copper product in this country has heen wonderfully increased, and that these mines have gained for us the leading position of all copper producing countries of the world.

In the annual review of the MINING AND SCIENTIFIC PRESS, January 24th, we gave the statistics of the copper production of Arizona and Montana. California only produces about 1,000 tons a year, so its product cuts a small figure in the general result. Nevada has plenty of copper, hut there is now small encouragement to develop her mioes.

We are on this coaet, in the matter of copper, largely interested in the English market, and the London and Liverpool prices, give the general hasis of value. During the last two years Chile bare ran down from £65.105 in January, 1883, to £45.55 in Decemher, 1884. Our American product hss greatly affected that market. We only shipped to England 4,000 tons of copper in 1884, and 17,000 tons in 1883, while in 1884 we sent over 28,000. This, of course, kept prices down.

There is this to he considered, however. The consumption of copper in England was 10,700 tone greater in 1884 than in 1883, large as it then was, and this taking place in the face of the general dullness of trade, the diminution of ship huilding hy nearly one-half the average of the previous three years, which was a million of tons. It can only be accounted for hy the extended use of hrass for domestic and ornamental purposes, and the application of copper in the place of other metals, as the natural resnlt of decreased co[illegible]. The export from England was last year 5,300 tons less than in the previous one. In France, the consumption has heen 3,000 tons less than in 1883. The importatiou of copper into England, which in 1883 exceeded that of 1882 by 9,500 tons, increased last year 10,700 tons over 1883. This latter increase was made up of 3,000 tons from Chile 7,900 tons from the United States, 1,100 tons from Australia, 400 tons from Cape of Good Hope and 200 tons from Italy; while the supplies from Spain (including pyrites) decreased 2,600 tons, from Newfoundland 1,000 tons, and from Quebrado 300 tons. Some 5,000 tons Chile hars were imported into France, but 2,750 tons more ingots and slahs were imported from the United States, which was a point gained for our copper miners. Moreover, ahout 3,000 tons of fine copper in the form of ingots, slahs and matte were shipped from the United States to other parts of the continent, and 850 tons of copper from Chile went direct to Germany.

Rather a curious fact is, that the consumption of copper in England and France exceeded the importations hy 2,000 tons, yet prices declined. James Lewis & Sons, the Liverpool copper dealers, attrihute this partly to the prevailing despondency arising from dull trade, hut more especially to the announcement in advance of increased production of ons Montana mine, and of an intended increase from the Rio Tiuto and Quchrado mines, to compensate for dimioished value; also to the mode lately adopted of selling large quantities of ore matte and other copper, on the hasis of Chili hars at the time of delivsry. It is not that the copper production of the world has heen excessive during the past year; on the contrary it shows a reduction, hut the rumors prevalent concerning, and the uncertainty of the prodnction of American mines, have kept the market in a state of douht, advantage of which was taken by speculators to depress values.

Profits of Hydraulic Mining.

In the late legal proceedings against the hydraulic miners, it wae attempted hy their opponente to show that this brench of mining had, as a general thing, proved unprofiteble, a good deal of the testimony adduced on the part of the plaintiffs heiog designed to establish the affirmative of that proposition. Whatever may seem to have heen the weight of testimony hearing on that point, as hrought out during these triale, certain it is, no kind of mining, either here or elsewhere, has paid better on the whole than this. For 15 or 20 years large numhers of miners engaged in hydraulic operatioos, made good wages, washing the top stratum of gravel, which, heing loose and free from pipe clay and large boulders, could he run off with comparatively little water, nor was much capital then required to open up and outfit their claims.

Gradually as this top gravel came to he disposed of, difficulties of various kinds developed themselves in connection with this class of operations, some of them so serious as to necessitate the employment of much engineering skill and the expenditure of large sums of money. Thus, long ditches had to he constructed over rugged districts of country; enormous reservoirs had to he huilt at great elevations io the mountains, costly hed-rock tunnels had to he driven and ao expensive and powerful plant provided for washing purposes. In short, the whole hnsiness had to he reconstructed, learned anew and conducted on a gigantic scale. But there were found men of skill, nerve and large means ready to undertake the difficult task, which, in good time, was well accomplished.. During these years of heavy expenditure, constructioo and trial there inured to the investors, as a matter of course, no very large net revenues. Nevertheless, not more than a few of these enterprises failed to be self sustaining, nor were many of them without some profits from the start.

But just when this enlarged system of hydraulic mining had, through such persevering effort and the expenditure of enormous sums of money, heen hrought to perfection, and the investors had begun to reap the reward of their costly and hazardous ventures, the courts interpose and put a stop to further operations, inflicting terrible loss on the owners of these properties and involving many of them in irretrievable ruin. To call io question the profitahleness of hydraulic mining under circumstances like these is alike ridiculous and unjust. So far as the husiness has heen permitted to go on unmolested it has proved not only remunerative, hut extremely profitahle, though stricken down just as it was escaping from its hurdens and embarrassments and entering upon an era of assured success. Whether hydraulic mining ehall be suffered to go on in the districts where it has been partially estopped or not, one thing is certain: It will be prosecuted very actively hereafter in those sections of the State where it has not heen interfered with, more especially along the Klamath river and some of its trihutaries, whers, hy reason of the favorahle conditions that there exist, it seems destined to undergo a rapid expansion. This industry is not deed, nor yet even crippled in more than a portion of the State, this northern field heing not only well conditioned, hut quite extensive. It has openings for cepital that are worth looking after.

New Quartz Crushing Device.

Aaron G. and James M. Dyer, of this city, have patented, through the MINING AND SCIENTIFIC PRESS Patent Agency an improved form of quartz crusher, which, though very simple in construction and operation, possesses some peculiar features. The receiving and crushing chamher is cylindrical in shape, the ore coming in at the top opening. This receiver is olossd at one end, made hsavy and strong, and is supported on a shaft above the line of the shaft carrying the crushing cylinder, which is inside the receiver. The receiver is lined with removahle dies. A shaft extends out horizontally from the closed end, turns in suitahls boxes and supports the receiver, to which it is eccentrically secured.

From the closed end of the receiver an arm extends upward and forme a lever to which power is communicated to oscillate the receiver to and fro. This movement will hring the sides of the receiver in closer contact with the interior cylinder, and thereby reduce the rock, which moves downward between the two at each oscillation. Power is easily applied to move the parts.

The cylinder in the receiver is of sufficient length to just fit hetween the ende of the receiver, and considerahly smaller than its inside diameter. This cylinder has a shell or cruehing shoe, made removahle in case of wear. The cylinder has a shaft extending out through the open and of the receiver, opposite the other shaft, but at a point somewhat lower down. The two shafts are not in line, but mounted eccentrically with respect to each other.

The cylinder-shaft is in hoxes so it and the cylinder are free to turn, and the receiver has an opening in its lower part through which the crushed material may escape. A flange is fitted to the end of the cylinder next to the open end of the receiver, and prevents the escape of material at that point. The exterior of the cylinder lies so close to the hottom of the receiver as to determine the eize of the particles which may pass hetween the two, and the space on each side of the central point gradually widen toward the top of the receiver. The hearinge of the shafte are vertically adjustahle so ae to regulate the distance between cylinder and receiver to such degree of fineness of pulp required.

The operation of the device is as follows: Ore being fed into the receiver will lie on each side of and ahove the internal cylinder, and when the receiver is oscillated the material hecomes wedged between the sides of the cylinder and receiver, and as the receiver moves hack and forth the cylinder is caused to rotate in the same direction hy the wedging of the rock hetween the two, and as the rock passes downward it goes ioto a narrower and narrower space and is crushed. The rock on the opposite side will slip down into the widening space on that side, to become in turn wedged between the cylinder and receiver and carried down and crushed hy the return oscillation of the receiver. The rock is thus gradually carried down and crushed until it reaches the narrowest epace heneath the cylinder, from which it escapes through the discharge opening. By this apparatus Messrs. Dyer are eoahled to gradually reduce rock or other material from large pieces to a considerable fineness, so so that little or no further crushing operation will he necessary.

OWING to the heavy cost of mining and the large discount on eilver the managers of the principal mines in Tuscarora district find it impossihle to pay the present wages to miners and other employes, and have determined to reduce them.

ALL hands have heen discharged at the Oshiston shaft, on the Comstock. Everything connected with the mine was put in good condition previous to the ehutting down, and work can be resumed at a moment's notice.

Fire Insurance on the Pacific Coast.

In those days of enterprise and development, when it is desirable to throw every possible safeguard around the work undertaken, insurance is found to be intimately associated with nearly every branch of industry and commerce. To such an extent is this the case that it has passed into a truism that "That business which it does not 'pay' to insure will not 'pay' to run." The miner who cannot "afford" to insure his mill is not certainly in such a condition of wealth as to "afford" to add to his other ventures the chance of said mill being destroyed by fire. The farmer who cannot "afford" to insure his grain in warehouse certainly cannot "afford" to risk the destruction of the entire season's product by fire, and the wheat grower who cannot "afford" to insure his standing crop certainly cannot "afford" to raise it. In all of these cases if the owner of the property is so poor, or if his business yields such meager returns that he feels that he cannot spare the money wherewith to pay a premium which will secure him against a possibly overwhelming disaster, he can with but a sorry show of logic argue that he is able to carry the chances of such disaster on his own shoulders. Insurance is, in these days, as much an accessory to the business of the miner and farmer, as is the improved vanner and rock crusher in the one case and perfected agricultural machinery in the other. This being the case, we feel that our readers will be interested in learning more about the business of fire insurance as conducted on this coast.

In the early days it was impossible to obtain any insurance on the Pacific Slope, and many a man was impoverished by the destructive fires which occured at that time. Within eighteen months, embracing the year 1850 and portions of 1849 and 1851, the citizens of San Francisco alone lost sixteen millions of dollars by fire. In 1852 the first insurance agency was established on the Coast, in 1868 the number of companies represented had increased to twenty-one, while now it is nearly one hundred. These companies pay out to our citizens annually two and one-half million dollars for losses.

With one or two exceptions these companies have their home offices or general agencies in San Francisco, and, as is the case with other classes of business, they colonize together. What Wall street is to the financial interests of New York, California street is to the insurance interests of this Coast. We have had prepared an excellent engraving, which gives a correct idea of this portion of the city. The building with the clock tower, is the Merchants' Exchange, (now owned by the Produce Exchange) while the most prominent feature of the engraving is the new and elegant building of the Fireman's Fund Insurance Company. While all the buildings shown in the picture contain underwriting agencies the southwest corner of California and Sansome streets, on which the Fireman's Fund building is located, is distinctively known as the insurance center of San Francisco. Twelve insurance companies have their offices in this building, and it also contains the rooms of the Insurance Commissioner of the State of California, as well as those of the Board of Underwriters and the Pacific Insurance Union, so that first or last, every company on the coast must come to this "center" in the course of the transaction of its business. The building is provided with elevator, electric bells, speaking tubes and all the latest improvements.

The principal office therein is the one on the main floor, which is occupied by the corporation owning the building, the Fireman's Fund Insurance Co. This insurance office is the largest in area as the company is the largest in size of any on the Pacific Coast. It is, in fact, found necessary to connect the several desks by a series of telegraph wires and speaking tubes, in order to expedite the immense business which is transacted here. The reader may get some idea of the amount of this business when we state that the company has 1,500 agencies scattered throughout the United States; that its gross premiums amount to about $1,000,000 per annum; that it pays an average of two losses per day; and that the "home office" above referred to is the spot at which all this business is concentrated. Since its organization, 22 years ago, the company has paid $6,000,000 for losses, $813,766 of which was for losses in the great Chicago, Boston and Virginia City fires. Our farmer friends will be particularly interested in knowing that the Fireman's Fund was one of the pioneers in that branch of underwriting known as "growing crop insurance." Its experience has enabled it not only to perfect a very popular and easily understood form of crop policy, but also to adjust in an equitable and prompt manner all losses that may occur.

From the foregoing remarks it will be easily understood that the Fireman's Fund building is not looked upon as the insurance center of San Francisco solely by reason of its location. Although every fire insurance office in the city is within one block of it, to the north, south, east or west, the standing of the company itself has much to do with the prominence which attaches to the location. With assets of over one and a half million dollars, it affords to policy-holders more than three dollars, in the shape of security for every dollar of liability (present and prospective) which it owes to them, and is the leading, as it has for years been the largest Pacific Coast company. It is, in fact, the largest company organized, west of New York State.

When a company affording such solid indemnity can also lay claim to patronage, on account of keeping its money at home, helping the State by way of taxes paid, and helping its citizens by reason of money loaned, it should certainly be entitled to a continuance of the favor, which has been bestowed upon it in the past. The conservative management of the company is shown by the fact that, although it does the largest business on the Pacific Coast of any company, American or foreign, it has at risk in San Francisco, in proportion to its assets, less than one-third the average amount carried by other "local" companies.

Another point not to be lost sight of is, that in event of loss, the assured deal directly with the company, thus securing a promptness and freedom from "red tape" and circumlocution, which are often impracticable in the case of foreign companies.

We cannot, in justice to our readers, dismiss the subject of insurance without calling particular attention to the fact, so often overlooked by many, that the lowest priced policy is not the best bargain, but that, on the contrary, it is, as a rule, the poorest. If a farmer buys a plow or a mill-owner an engine at half what it costs to manufacture it, his purchase is at once delivered to him, and he gets a bargain; but if he buys a promissory note at fifty cents on the dollar, or a "half price" insurance policy, the coin which is represented by the paper is not delivered to him at the time and the chances are that he is "gambling" in a game at which he will be the loser. As insurance companies derive their coin wherewith to pay losses from the sale of their promises to pay (the policies) it is evident that if they sell them for half what experience has shown to be necessary in order to pay losses and expenses, the purchaser of the policy will be doomed to disappointment when a fire occurs. "The best is the cheapest" in insurance as well as in other matters, generally speaking.

THE INSURANCE CENTER OF SAN FRANCISCO.

PRESIDENT ARTHUR has designated Prof. George Davidson of the United States Coast and Geodetic Survey (now temporarily in Washington), as "one of the Commissioners to examine and test the fineness and weight of the coins reserved and forwarded for this purpose by the several mints of the United States during the year 1884." The Commissioners will meet at the Mint at Philadelphia on the 11th of February and the examination and tests usually require three days' work, for which there is no compensation.

A GOLD BEARING LEAD.—According to report what promises to be a very valuable gold mine has been discovered in Winnemucca mountain. The discoverers have kept the matter quiet until they ascertained by development whether they had a ledge or not, but we learn from a reliable source that they have uncovered a lead over five feet wide carrying ore that assays about $40 per ton in gold.—*Silver State.*

WE received at this port in January 89,677 tons of coal as against 72,059 tons in the same month of 1884. The Wellington was on fire during a portion of the month. The steam collier *San Pedro*, made two trips to the Carbon Hill mine last month, the first in three months.

THE State Miners' Union has issued an address for a reduction of 10 per cent all over Ohio in coal mining. This practically ends the Hocking Valley strike, as it brings the rate to 60 cents in that district.

THE stockholders of the Queen of the Hills mine, Wood river, Idaho, have been paid $12,500, a ten per cent dividend.

The Appropriation of Water.

The Legislative Committee of the State Irrigation Convention have given their views on the questions entrusted to them in the shape of bills which have been duly introduced at Sacramento. There are five of them. One repeals Section 1,422 of the Civil Code. This is the section which seems to recognize riparian rights. Another amends Section 4,488 of the Political Code, making it read as follows:

"The Common law of England, so far as it is consistent with and adopted to the natural and physical conditions of the State, and the necessities of the people thereof, and not repugnant to, or inconsistent with the Constitution of the United States, or the Constitution or laws, or established customs of the people of this State, is the rule of decision in all the Courts of this State."

Another bill is concerning the appropriation of water and is as follows:

SECTION 1. Every person, company, association or incorporation, appropriating, diverting or claiming the right to divest, for agricultural purposes or other beneficial uses, the waters of the lakes, rivers, streams or other natural sources of supply within the State, shall, within one year after the passage of this Act, file in the office of the County Recorder of the county embracing the point of diversion, a written declaration in duplicate, stating:

(1.) The source from which the water has been actually diverted, and, if diverted undsr a claim of right, the origin, nature and character of such claim.

(2.) The place where and the time when the first diversion was in fact made; and its extent thenceforth to and including the time of the filing of said declaration.

(3.) The kind and dimensions of the works by which the diversion has been and is effected.

(4.) The place or places, where and the specific use or uses to and for which the water has been and is applied or employed, and is and the area and description of lands, if any, irrigated thereby.

And in the case of a claim or right to divert, but without previous actual diversion, the said declaration shall state:

(a) The origin, character and date of such claims;

(h) The source of supply to which it is claimed the right attaches;

(c) The quantity of water claimed and the point of intended diversion;

(d) The purpose for which tbe water is claimed and the place of intended use;

(e) The means by which it is intended to divert the water, and the size and grads of the ditch, canal, flume, pipe, aqueduct or other works by which it is to bs diverted.

(f) The works, if any made or constructed, in and by whicb it is intended to divert the water, the extent thereof, and when their construction commenced and ceased.

In each of the cases above named, the said declaration, in so far as the description of works and measurements of water are concerned, shall be made substantially in the form and according to the explanations to be furnished by the State Engineer, and said declaration shall be signed hy the appropriator or claimant, or, where a corporation is the declarer, by some person thereto duly authorized, and shall be verified by the oath of a party thereto, to the effect that said declaration is true to the best of his knowledge and belief.

SEC. 2. The State Engineer shall make out and cause to be printed, blank forms of statement for the foregoing declaration of facts as to dimensions and description of works and volumes of water, together with explanations such as will conduce to uniformity of result in their use, and shall furnish the same in sufficient quan'ities to the several offices of County Recorders. The County Recorders shall furnish all applicants, who propose complying with the provisions of this Act, with such number of these forms and sxplanations as will serve their purpose. The County Recorder shall receive and receipt for the declarations mentioned in Section 1; shall file one copy of each in his vaults and shall forward the duplicate thereof, by the safest ordinary conveyance for similar matter to the office of the State Engineer, at the State Capitol.

SEC. 3. Upon failure of any claimant of a right to divert water from natural sources of supply, to make and file the declaration of claim as prescribed in Section 1 of this Act, such claim and every right therein and thereby set up or asserted, shall, by force and effect of failure itself and alone, cease and thereby be conclusively deemed waived and abandoned.

SEC. 4. As soon as practicable after the expiration of the one year in which the declarations of claim are to be made, as provided in Section 1 of this Act, the State Engineer shall certify to the Attorney General a complete list of the instances of diversion of water grouped according to the several sources of supply to which they are applied, according to the information iu bis office or in the offices of the County Recorders.

SEC. 5. As soon as practicable after the receipt of the certified lists of diversions provided for in Section 4, the Attorney General shall cause to be brought, in the name of "The People of the State of California," and to be prosecuted to judgment, with all practical speed, in the Superior Court of any county through, by or in which such stream flows or source exists, and wherein any appropriations, diversions or claims of right are located, an action against all the claimants to the waters of said stream jointly, naming them so far as known, and against all unknown claimants thereof. The complaint, after stating the title of the action, the name of the Court and county, and the names of the parties, so far as these can be conveniently ascertained, shall set forth that the defendants divert, or claim the right to divert, the waters of the certain source, to the extent and by the means of works either actual or proposed, as, in the State Engineer's said statement, are particularly designatcd, located and described, specifying such particulars from and according to said statement. The complaint shall then further aver, upon information and belief, that the said diverted water, in each instance, is diverted without right or authority in law; and pray that the defendants answer and fully disclose and

First.—Whether their said several appropriations, diversions or claims of future right to divert and appropriate are made, under claim of right.

Second.—If made under a claim of right in each case, the origin thereof, and when and how the asserted right accrued.

Third—When, in each case, the first diversion was made, its then extent, and the extent of the diversion thenceforth and to the time of the said action brought.

Fourth—When, where and how and to what extent the waters diverted, in each case, have been utilized each season of diversion.

Fifth—The size and character of the works for diverting the water and for conducting it to the place or places of use.

Sixth—Ths extent of the claim of right to future diversion, and the size and character of the proposed works.

And the complaint shall further pray that all the said several matters of fact, as to which discovery is sought, be settled and adjudicated by the findings of the Court, and judgment bs entered accordingly; and that in default of appearance and answer by either defendant, his claim of right be adjudged waived and abandoned.

SEC. 6. The summons must be directed to all parties to the action named in the complaint, and generally to all other persons claiming to have any right to appropriate, divert and utilize the waters of said stream or source of supply, or any part or portion thereof; and in addition to the then existing sta utory requirements in that behalf, shall direct all persons interested in the appropriation, diversion and utilization of the waters of said stream or source of supply, to appear in said action in the Court wherein said action is pending, and set forth the character, nature and extent of their interest or claim of interest therein, and notify them that if they fail to appear and answer the complaint and to set forth their respective claims, judgment will be entered against them and each of them that they have not, nor has either of them, any right to divert and utilizs said waters, or any part or portion thereof.

SEC. 7. After the filing of said complaint, the Court in which said action is pending, without any affidavit in that behalf, shall order the said summons to be published at least once a week for two months, in some one or more newspapers designated by the Court, one of which shall be printed in the county in which said action is brought, if there be one printed in county; and if the strsam runs through two or more counties the Court may, in its discretion, order the said summons to be also published in a newspaper printed in any other county than that in which said action is brought, through or into which said stream flows. And the said Court shall, at the same time, order said summons to be posted on said stream or source of supply, at all points of actual diversion, appropriation or use of the waters thereof. The posting may be made by any citizen or citizens of the State, over twenty-one years of age. Said summons shall be served personally upon all the defendants named in the summons, who can with reasonable diligence be found in the State. All parties interested shall have the same time to answer the complaint, after service of summons, as is provided in Section four hundred and seven of the Code of Civil Procedure. The service of publication shall be complete at the expiration of the actual publica'ion thereof in the newspaper or newspapers as heretofore provided, and the service hy posting shall be complete at the end of sixty days from the posting thereof.

SEC. 8. After service of snmmons has been completed, as heretofore provided, the Court shall examine into the nature and character of the service thereof and ascertain whether it has been in all respects as herein provided. If the Court finds that in any particular the service is incomplete, it shall order the service in that respect only to be remade, and when finally completed in accordance with the provisions hereof, to the satisfaction of tbe Court, the Court shall enter its decree that due and legal service of said summons has been made upon all persons whomsoever interested in any way whatever in the division and utilization of the waters of said stream or source of supply, and said decree shall, in that respect, be conclusive upon all persons whomsoever, and thereafter said Court shall be conclusively deemed to have, and shall have, complete jurisdiction of the subject matter of said action, viz.: all the waters of said stream or force of supply, and of all persons whomsoever having any right to divert, utilize or appropriate the same or any part or portion thereof, and to that end the action is, and is hereby declared to be a proceeding in rsm.

SEC. 9. If, during the pendency of the action, any of the parties die or become insane, or incompetent, the proceedings shall not for that reason, or any other reason, be delayed or suspended, or in any manner affected.

SEC. 10. The Court having jurisdiction in said cause, as hereinbefore provided, shall proceed to adjudicate and detsrmine the rights of all persons interested, and to that end shall have power to refer the sams to a referee to take testimony as to the rights of the respective parties, and report the same to the Court, and generally the said Court shall have, in that behalf, all the powers both of Courts of law and equity, and the proceedings shall be according to the rules laid down in the Code of Civil Procedure of this State, except where herein otherwise provided.

SEC. 11. The Court shall, in its decree, determine, adjudicate and establish the origin, extent, nature and validity of all diversions, appropriations and utilizations of water for agricultural purposes and other beneficial uses made upon the stream or source which is the subject of the particular action before it, the date and extent of such appropriation, the relative rights of each appropriator, diverter, nssr and claimant, with reference to others as to priority and extent of, and limitation upon the rights of each in the waters of the stream.

SEC. 12. Any party interested shall have the same right to motion for a new trial and appeal as is provided by the law for other cases.

SEC. 13. Said decree shall be conclusive on all persons whomsoever, and no such decree shall be invalid by reason of the death of an person interested pending the action, or before decree, but such decree shall be as conclusive against the heirs, legal rspresentatives or assigns of such decedent as if it had been entered before his death.

SEC. 14. If any one or more of the parties defendant in any one of said actions shall object in writing to the trial thereof by the Judge of the Court in which it is pending, the said Judge shall thereby become and be disqualified to try the same, aud thereupon the Governor, at the reqnest of the Attorney-General or any party or on his own motion, shall designate some other Superior Judge to hold said Court, whenever, and at such times as may be necessary to try said action, and to determine all matters therein, and such Judge shall be allowed his actual expenses in going to and returning from and attend upon the said Court in that behalf, which shall be a charge upon the treasury of the county whers such Court is held, and paid out of the general fund thereof.

SEC. 15. It shall be tbe duty of every person, company, association or corporation, who or which has made a declaration in accordance with the requirements of Section 1 of this Act, to annually hereafter file in the said County Recorder's office a statement in duplicate, showing:

(1) The extent of the actual diversion of water, and what increase, if any, has been made therein since the filing of the original declaration.

(2) The extent and dimensions of the works by which the diversion has been and is affected, and what additious and enlargements have besn made therein since the filing of the original declaration.

(3) The place or places where, and the use or uses to and for which the water has been and is applied or employed, and the area and description of lands, if any, irrigated thereby, and what is the extent of the additional use of said water, if any, since filing the original declaration.

SEC. 16. It shall be the duty of every person, company, association and corporation who or which desires hereafter to appropriate, divert or use, or to acquire the right to appropriate, divert or use the waters of the lakes, rivers, streams or other natural sources of supply within this State, under the laws thercof, within 60 days after the commencement of their claim, to file in the office of said County Recorder, a declaration in form, as provided in the latter part of Section 1 of this Act, for claimants of a right to divert without previous diversion, and thereafter all claimants shall make the annual statement provided for in Section 15 hereof.

SEC. 17. Words used in this Act in the present tense include the future as well as the present; words used in the masculine gender include the feminine and neuter; the singular number includes the plural, and the plural the singular; the word person includes a corporation as well as a natural person.

SEC. 18. This Act shall take effect immediately after its passage.

PROTECTION OF MINERS.—When Samuel T. Oates was a member of the Legislature from this county years ago, he introduced a hill compelling mine owners to provide two places of egress from underground mines, so that in case of accident the miners would have better means of escape. The bill, we believe, passed both houses and became a law. Senator Reddy has introduced into the present Legislature a bill that is similar in some respects to the one presented hy Oates. "The bill makes it unlawful for any mining corporatiou to sink the shaf s below 300 feet without a second mode of egress from such mine hy shaft or tunnel, to connect with the main shaft at a depth of not less than 100 feet from the surface. When the company fails to provide the mode of egress, and any accident occurs to any minsr, the owners are made liable for all damages which may be caused by the accident. It is also made unlawful for any company where there is no second mode of egress, and where steam hoisting works are used, to leave the hoisting works iu chargs of but one person."

Locating Mining Claims.

The following circular has been ssnt out from the General Land office at Washington to United States Surveyors General and Registers and Receivers:

1. The rights granted to locators under Section 2322, Revised Statutes, are restricted to such locations on veins, lodss or ledges as may be "situated on the *public domain*." In applications for lode claims where the survey conflicts with a prior valid lode claim or entry, and the ground in conflict is excluded, the applicant not only has no right to the excluded ground, but he has no right to that portion of any vein or lode the top or apex of which lies within such sxcluded grouud, unless his location was prior to May 10, 1872. His right to the lode claimed terminates where the lode, in its onward course or strike, intersects the exterior boundary of such excluded ground and passes within it.

2. The end line of this survey should not, therefore, he established beyond such intersection, unless it should be necessary so to do for the purpose of including ground held and claimed under a location which was made upon public land and valid at the tims it was made. To include such ground (which may possibly embrace other lodes) the end-line of the survey may be established within the conflicting survey, but the line must be so run as not to extend any further into the conflicting survey than may be necessary to make such end-line parallel to the other end-line, and at the same time embracs the grounds so hsld and claimed. The useless practice in such cases of extending *both* the side-lines of a survey into a conflicting survey and estahlishing an end-line wholly within it, beyond a point necessary under the rule just stated, will be discontinued.

3. After the receipt of this circular at the local land office all applications for mineral patents, applications to purchase, Register's final certificates of entry and Receiver's receipts must not only describe the ground claimed but must state specifically what conflict or conflicts with other survsys, lots or claims are excluded, giving the number of each conflicting survey or lot. The published and posted notices must contain the same information.

The Mint Director's Report.

The Director of the Mint is engaged in the preparation of his report on the production of gold and silver in the United Statss during ths calendar year of 1884. From the returns mads from mints and assay offices, it appears, he says, that, contrary to his own expectation and general opinion, a greater amount of gold was obtained from the mines of the United States in 1884 than during the previous year. Reports from mints aud assay offices of the deposits of gold and silver which he caused to be verified hy the accounts, show that during ths calendar year of 1884 they received gold of domestic production to the amount of $30,807,169, nearly $800,000 more than tbe previous year, while the deposits of foreign gold bullion were $11,217,309; foreign coin, $9,328,922; jewelry, plate, etc., $1,899,577, and United States gold coin $265,171. The total, excluding redeposits, $50,518,148. Burchard says there can be question but that nearly $31,000,000 in gold, as shown by the reports, were obtained from mines in ths United States during the last calendar year, because the description and character of the gold is apparent to the weight clerks upon inspection, or is easily ascertained, and generally the locality, also from whence received, by inquiry, or knowledge of the husiness depositor, and is entered on record. Secondly, every ounce of $50,000,000 of gold reported to have been received during the ycar is entered in the accounts, and has been or must he paid for by the officers in charge of the institutions where it has been received. Thirdly, the deposits of foreign gold bullion exceeded its net imports $2,475,797, and although deposits were less hy uearly $3,000,000 than the imports of foreign gold coin, it was because that of the imports of the lat'er last November and December at ths port of New York, amounting to nearly $5,000,000, only $681,612 had, up to the first of January, been sent to the New York assay-office, the remainder probahly being held in New York, perhaps awaiting the export demaud. It is improbable that foreign bullion could be entered at the New York assay office as domestic gold. The director says that no deduction should be made on that account from the $30,800,000 of the reported deposits of domestic gold bullion.

THE Union Pacific system consists of 4,748 miles of road under the full management of the company, and enough more in which the company has a controlling interest to bring the entire system up to 5,670 miles, making it the most extensive railway system in the hands of one company in America.

Montana Smelter.

The *Butte* (Montana) *Miner* says: It has been rumored upon the streets for a few days past, that several, if not all the copper smelters, in the vicinity of Butte and the Anaconda smelter would shut down in the near future. Inquiry develops the fact, that there is more foundation for the rumor than is agreeable to contemplate. The cause assigned for the shutting down of the work, is the unprecedented low price to which copper has fallen. The metal is now quoted at 9½ cents in New York, with no visible prospects of an immediate advance. Smelting men say it costs 9 cents a pound to lay down copper in that market, and that to continue the smelting of ore at that price is like working for a new dollar in the place of an old one, and that they do not care to exhaust their mines without some remuneration for the wear and tear of their plants. We understand that the mines will be worked as usual, and probably with the usual complement of men, the smelters alone being closed down.

While it is not pleasant to contemplate this condition of things, it is well that all should realize its possibility and prepare to face this reality. Forewarned is forearmed, in this contingency, as well as in others. The shutting down of the smelters, would throw hundreds of men out of employment, and work a great hardship to many who are not prepared to pass through the bleakest season of the year in idleness. The question then arises, what shall be done? or what can be done under the circumstances? An advance in the price of copper would settle the problem, but as we have said, there is no present prospect of such advance. This being the case, there must be a cutting down of expenses somewhere, that copper miners may realize a fair profit upon their investment. Where should that cutting down be done? Let us see. The Utah and Northern railway on an average, ship daily from this place twenty-five carloads of ore and matte to Omaha. Each car takes ten tons, and the twenty-five cars 250 tons. The freight on this ore and matte, we understand, is $20 per ton or $5,000 per day. We furthermore understand that the actual cost to the railway company of this transportion to the point named, does not exceed $3.11 per ton, thus leaving a clear earning of $16.89 per ton or $4,252.50 per day. Of course, a certain amount must be deducted from the latter sum of wear and tear of road and rolling stock and interest on money invested, etc.

In considering what the railway company can do in the matter of reducing freights and thus aiding copper miners, another important point must be noted. Butte business men, smelting men and miners, pay on an average about $7,000 a day or $215,000 a month, charges on incoming freight, making an aggregate of $12,000 a day or $360,000 a month paid for freight by Butte business and mining men alone. In view of these facts and figures, it would seem that the railway company should not step forward and help the smelting men out by a pronounced reduction of freight charges each way. Their interests, it would appear, lay in the direct line of this step. One thing, however, is certain. If a reduction is not made in the expense attending the laying down of Butte copper in the New York market, the Utah and Northern may as well prepare to side track a large number of freight cars.

WORKING TAILINGS.—The Pioche (Nevada) *Record* says that the Bullionville Smelting Company has purchased the Dry Valley tailings, and that Mr. Godbe is expected there to rebuild the track of the railway which was torn up last fall by Bishop Taylor, of Iron county, Utah, so that he can transport the tailings cheaply to the reduction works at Bullionville. After seeing this notice, a reporter of the *Tribune* met Mr. W. S. Godbe, who said it is true they have bought the tailings. He estimates the tailings at 25,000 tons, assaying about $15 per ton in gold and silver. The railroad from Bullionville to Pioche was bought to remove into Iron county to aid in opening up the iron mines there. The rails and ties are piled up along the track, and if the material can be rented on favorable terms the road will be put down between Bullionville and Panacca, at which latter place the tailings are, and used for transporting the tailings. If not, they will be worked where they are without roasting, and this will cause the loss of many thousands of dollars which would be saved by roasting. It would benefit the owners of the road materially and the people in that locality to have the road running. Mr. Godbe expects to visit that locality soon, and make some kind of arrangements for the coming season's operations. The tailings are to be treated by the use of sulphur. The Bullionville works get their sulphur from Decker's sulphur works.

DANGER FROM PAMPAS GRASS.—A Philadelphia lady recently received a large package of that showy and feathery grass as a Christmas present. The plumes were laid upon a table under a hanging lamp. In handling them, the dust or down which always arises from them, when handled suddenly took fire; and burnt with an explosive energy similar to the explosive burning of dust, which often occurs with disastrous effect in flour mills. As pampas grass is quite a popular ornament, it is well to know that such accidents are possible when these plumes are brought near a flame.

USEFUL INFORMATION.

DARNING WITH HUMAN HAIR.—A Baltimore merchant tailor says he frequently does fine darning with strands of hair from his wife's head. It often happens that there is a small clean-cut place in a bolt of goods. It may not be known until after a garment has been cut out. But when it is discovered the tailor cannot afford to throw the piece. He simply calls on his wife for several strands of hair, hands them to the best-skilled workman in the shop and bids him mend the rent. He uses a very fine needle, and does his work so perfectly that it is never known that the cloth was cut. He said to a reporter: "I once knew a tailor who got in a peck of trouble from having cut the button-holes on the wrong side of a costly coat. He finally overcame the difficulty by mending them with his wife's hair. Once upon a time, as the story book says, I cut out and had made a fine cloth coat, which was discovered, before being sent home, to have a defect in it which could not be remedied without stitching it with a piece of cloth the size of a ten cent silver piece away. After puzzling over it for half a day, I secured a sharp tubular steel instrument, such as one would think might be used in cutting gun wads. With this I cut out the defect in the cloth, fitted a piece in the hole taken from a scrap of the same material and sewed it with hair. Of course I was careful to have the nap run right. It was so perfectly done that no one ever discovered it."

PRESERVING EGGS.—At the Birmingham Poultry Show, England, prizes were offered for the best dozen preserved eggs that had been kept two months. The eggs were tested by breaking one of each set competing for the prize into a clean saucer; also by boiling one of each lot. The eggs that had been preserved in lime water, it was found on breaking them, presented cloudy whites. Eggs preserved by rubbing over with beeswax and oil showed thin, watery whites. Eggs that stood best the test of boiling, and which gained the first prize, had been simply packed in common salt. These had lost little, if any, by evaporation, had good, consistent albumen, and were pleasant to the taste. The exhibit which took the second prize was scarcely inferior in quality. They were preserved as follows: Melt one part of white wax to two parts of spermaceti, boil and mix thoroughly; or two parts clarified suet to one of wax and one of spermaceti. Take new-laid eggs, rub with antiseptic salt or fine rice starch. Wrap each egg in fine tissue paper, putting the broad edge downward; screw the paper tightly at the top, leaving an inch to hold it by. Dip each egg rapidly in the fat heated to 100°. Withdraw and leave to cool. Pack broad end downward in dry sand or sawdust. The judges were inclined to believe that had the trial been for a longer period than two months this latter method would perhaps have proven the better of the two. The eggs were excellent, and on stripping off the waxed paper the shells presented the clean, fresh appearance of newly-laid eggs.

AN IMPROVED BANK NOTE PAPER.—A new kind of paper for bank notes, bonds, etc., has been devised, which can neither be counterfeited or so far destroyed by fire as to become unrecognizable. To prevent destruction by fire a sufficient quantity of asbestos is worked into the pulp to prevent the bills from being reduced to ashes or lose the identity of their value. A sufficient quantity of linen or its equivalent is introduced into the pulp to render it sufficiently pliable and strong. The paper is further made with the denomination of the note or other security designated by means of silk fiber of different colors introduced within the body of the paper in the course of manufacture. For example, green fiber is taken to indicate $1, orange to indicate $2, blue to indicate $5, and scarlet to indicate $10. For $20 any two of these may be combined, and for $50 and $100, and documents above that value, three of the colors, according to any prearranged system. The fiber is also used for indicating the owner or origin of the bank note or other instrument by initials, names, or any other mark, private or otherwise, or any suitable device or form in which the colored fiber may be arranged.

CHANGING THE OYSTER'S FLAVOR.—An oyster expert thus discourses: You can change the flavor of an oyster just as you can a pot of soup. You know that in soups the stock or consomme is only made, and from that nearly all the other kinds are obtained by the addition of the chicken or vegetables, or whatever is used. Take an oyster and change it from salt water to fresh, or partly fresh, and it makes a difference in its flavor. The Northern oyster cultivators are studying this feature of the business, with a consequent improvement in the flavor and quality of the oysters. When the oysterman brings oysters in from the deep water and throws them over into fresh water, it is what they call "giving them a drink."

IS ARTIFICIAL STONE A NEW PRODUCT?—It is believed by many persons that the art of making artificial stones is prehistoric, and that the Pyramids were built of artificial blocks manufactured from the sands of the surrounding plain. In modern times a Frenchman named Coignet has accomplished some wonderful work with artificial stone. The most important and costly work that has yet been undertaken with Coignet's material is a section three miles in length of the Vanne aqueduct for supplying water to the city of Paris. Another interesting application of this material has been made in the construction of the lighthouse at Port Said, Egypt. It is 180 feet high, and resting upon a monolithic block of beton, containing nearly 400 cubic yards.

WHAT IS GLUCOSE?—Glucose is essentially the same as grape sugar, and glucose syrup is nearly identical with pure strained honey. It consists of 24 parts of carbon to 28 each of hydrogen and oxygen, whereas cane sugar contains the same amount of carbon and to only 22 parts each of hydrogen and oxygen. It is manufactured from the starch in corn and other grains by the action of dilute acids and alkalies, by a process too technical to be described here. Glucose is not unwholesome, but does not possess the same degree of sweetness as cane sugar.

THE AMERICAN WALNUT.—A writer in the *Gardener's Monthly* states that, when properly cured, the kernel of the American walnut is white and delicious, with a delicate flavor hardly surpassed by any nut. The nuts should be gathered as soon as they are ripe, and not allowed to remain in the hull. They should then be dried quickly.

SHAKE YOUR CARPETS OFTEN.—The oftener carpets are shaken, the longer they wear. The dirt that collects under them grinds out the treads. Do not sweep carpets oftener than is necessary. A broom wears them very much, When a carpet is faded, strong salt and water will often restore the brightness of the color.

THE MELLOWNESS OF OLD WINE, it has been found, is due to an increase in the proportion of glycerins contained in it more than to a decrease in the proportion of tannin which it holds. The orthodox *Churchman* says returning missionaries declare that unfermented wine was never known in Syria.

GOOD HEALTH.

How the Senses May be Deceived.

Immerse the forefinger of one hand in water at 104 degrees Fahrenheit, and then plunge the whole of the other hand into water with a temperature of 102 degrees Fahrenheit. The latter, although two degrees cooler will be judged to be the warmer of the two, from which it appears that the intensity of the sensation of temperature depends, not only more upon the relative degree of heat to which the parts are exposed, but also upon the extent of surface over which it is applied. From this cause a bath which is not uncomfortably warm when a few fingers are dipped into it, appears scalding hot when the whole body is immersed. The sense of temperature is, likewise, entirely at fault when required to determine which is the warmer of two substances, say a piece of iron and a piece of wood, for if they both have the same temperature, the iron will feel the hotter of the two, because of its being a so much better conductor. A slight difference of temperature, however, between two substances of like nature is easily discerned, and we may here describe a simple but highly entertaining trick which is founded on this fact.

The performer having placed his hat behind him, requests the people present to place in it three or four pennies. He shakes it up behind him, and then asks some person to take out a penny and closely examine it. He has then to pass it to the others for examination, the last one pitching it back into the hat again. The pennies are then re-shaken up, and the performer now, placing one hand behind him, picks out the penny which has been examined, although throughout the whole operation he has never seen it. When the experiment has been done some two or three times successfully all sorts of unlikely suggestions are made as to the way in which this feat has been performed, but very seldom the right one, which is exceedingly simple. The people in handling the penny which was selected from the others make it warm. It is, therefore, easy to pick it out from the others when it has been pitched into the hat again. This sufficiently demonstrates the fact that at ordinary temperature the sense of temperature as localized in the fingers is sufficiently sensitive to discriminate between several pieces of metal so as to say which is the warmest.

But for the extremes of hot and cold, touch is thoroughly deceived, a piece of frozen mercury giving a burning sensation like a red hot bar of metal. The touch which attains to such perfection in persons afflicted with blindness is readily deceived. This is shown forcibly by the experiment of Aristotle. Cross the index and middle fingers and run them over a marble placed on a table, with the eyes shut. Under such circumstances one has difficulty in avoiding the belief that he is dealing with two marbles instead of one. The idea of roundness which has been ordained by a complex judgment founded on the coalescence of several sensations, is here applealed to, but the usual conditions being reversed, we draw a wrong conclusion. The sense of taste may be likewise confounded by altering the conditions under which the gustatory operation is always carried on. Thus, if the nostrils be held firmly, it is impossible to distinguish between applying an onion or an apple to the tongue.

How Do You Lie?

Dr. Delaunay, an eminent French student, writes to the Paris Biological Society on the subject of dreams. He claims that the character of our dreams is very much determined by the position we occupy in sleep. The most general method of lying, perhaps, is on the right side, and this appears to be also the most natural method, for many persons object to lying upon the side of the heart, which, it has been more than once asserted, should have action during sleep. Nevertheless, Dr. Delaunay's statements hardly harmonize with this opinion. When one sleeps upon the right side, that is to say, upon the right side of the brain, one's dreams have marked and other unpleasant characteristics. These characteristics, however, are essentially those which enter into the popular definition of dreams. One's dreams are then apt to be illogical, absurd, childish, uncertain, incoherent, full of vivacity and exaggeration. Dreams which come from sleeping on the right side are, in short, simply deceptions. They bring to the mind very old or faint remembrances, and they are often accompanied by nightmares. Dr. Delaunay points out that sleepers frequently compose verse or rhythmical language while they are lying on their right side. This verse, though at times correct enough, is absolutely without sense. The moral faculties are then at work, but the intellectual faculties are absent. On the other hand, when a person slumbers on his left side, his dreams are not only less absurd, but they may also be intelligent. They are, as a rule, concerned with recent things, not with reminiscences.

SLEEPLESSNESS—In order to avoid sleeplessness, keep yourself free, as far as possible, from that fatal enemy of sleep, indigestion, by the strict adherence to those laws of diet which in these days of running after knowledge must be familiar to all of you. Take care that you abstain from those unhealthy and sleep-depriving heavy suppers; though there can be no harm in having a light meal of some plainly cooked nutritious food some little time before bed-time; in fact, in many cases of wakefulness in debilitated or even weakly persons, such a meal rather predisposes to sleep. Whatever is taken at the time should be easy of digestion and not likely in any way to irritate the stomach, and should be taken in a moderate quantity. Exercise, and exercise in the open air, is actually necessary for the preservation of healthy sleep, and among the women of our poorer classes, more especially those living in our towns, this is not thought of as it should be. If care and worry prevent sleep, I should advise some gentle occupation of the mind prior to retiring to rest—a game of chess, cards or backgammon, an hour's social conversation, or even a little reading when actually in bed, provided that it is nothing very exciting. A warm bath, again, is an excellent excitant of sleep, but must not be indulged in too often.

A NOVEL AND DELICATE SURGICAL OPERATION.—Dr. Axteile, of this city, is attending an important surgical case in Waterbury. Some six weeks ago, Michael Shea, while employed at the factory of the Scovill Manufacturing Company, had his hand caught in the straightening rolls. The member was frightfully mutilated, and amputation was at first thought necessary. With a forlorn hope the hand was kept, however, but it has obstinately refused to heal, the skin and flesh peeling off badly. Now the surgeons have decided to make an incision into the man's breast, form a pocket there and thrust his hand into it. There it will be kept for a week, when the flesh of the breast will have grown on to the hand, and then the hand will be cut away. The fingers, of course, cannot be fully restored, but the bare joints will be covered, and the whole hand practically restored to the man, who depends upon it for his daily food.—*Hartford, Conn., Post.*

DISINFECTING THE LUNGS.—Now that it is generally conceded that consumption is caused by germs which multiply in the lungs, a method of disinfecting them, which shall be harmless, has been sought for, but as yet without avail. The vapor of creosote, the oil of the eucalyptus, and carbolic acid have been tried, and, to some extent, they may paralyze or stun the germs and prevent their rapid increase; but as the passages of the lungs are delicate, and the vapor cannot be brought very near to them without injury, the good effects are slight. But there is one method which cannot fail to prove beneficial, and that is the inhalation of large quantities of fresh, pure air—the more of it the better.

THE TEETH OF MAMMALS.—In the majority of mammals the teeth are limited in number and definite in their forms. The number ranges from one in the narwhal to 220 in the dolphin. The average is 32, occurring in ruminants, apes, and man, but 44, as in the hog and mole, is called the typical or normal number, and this number is exceeded only in the lower groups.

INFLUENCE OF ARTIFICIAL FOODS ON COWS' MILK.—After experiments in 1883 and 1884, Messrs. A. Andouard and V. Dezaunay have concluded that pulps and other artificially prepared foods act injuriously on the milk of cows, but increase the quantity of butter without affecting its quality.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA

Amador.

SOUTH SPRING HILL.—Amador *Ledger*, Jan. 31: On Monday last we made a personal inspection of the improvements which have been recently made at this promising mine. First in importance is a new engine for hoisting purposes, purchased at the National Iron Works of San Francisco, at a cost of $5,000. It is supplied with solid cast-iron frame, and is in every respect a first-class piece of machinery. It is already in position, erected at an elevation of 10 ft above the platform upon which the old works stand. These works are said to be sufficiently powerful to meet all the requirements of the mine until a depth of 1000 or 1200 ft is attained. Everything is in position to start the new works, with a large quantity of flat wire cable on hand. The change will be inaugurated next Monday. The old works are now being run to their utmost capacity to get out a quantity of ore ahead so as to keep the mill running while the change is being made, which will take probably a week to complete. Connected with the boiler is a steam pump to supply water, also an injector, which utilizes the escaped steam, and thereby effects a great saving in fuel. A substantial building has been erected over the works, 100 ft long by about 40 ft wide, in which carpenter's shop, superintendent's office and changing room are conveniently located. Detached from this is a blacksmith snop. The new track from the mine to the mill is another noticeable improvement. It is 2000 ft in length, furnished with steel railroad iron, 16 pounds to the yard; 500 ft is laid on trestlework. A commodious ore bin, capable of holding 300 tons of rock, receives the ore from the mine. Immediately above the car-track the dump is supplied with a pair of chutes, operated by patent gates. The car is run under one of these, the gate is easily opened by one man, when the ore falls into the car by its own gravity, filling it in less time than it takes to describe it. The track is slightly up-grade to the mill, but one horse is able to haul the load without difficulty. The value of this track will be appreciated when we state that formerly it cost $250 to $300 per month to haul the ore by teams to the mill; now the cost does not exceed $30 or $40 per month. Underground the mine is looking as well as ever. The ore-body holds its own both in dimensions and quality. All the rock extracted so far has come from the 600-ft level —the only level at present in the mine. There is an air of thrift and good order about the works, which speaks well for the management. The company talk of adding ro more stamps to the mill the coming spring.

BUNKER HILL.—We are glad to be able to report this mine in a prosperous condition. The 40-stamp mill is kept running to its full capacity. A contract has been let to sink the shaft 100 ft deeper. Manual Costa was awarded the contract at $7 per foot, and commenced upon the job last week. Another contract has been let for making roo ft upraise, from the 600 to the 500-ft level. W. Perkins secured this contract, at $2.50 per foot, so we are informed. The work was commenced last Monday.

MISCELLANEOUS.—At the Medlan, the workmen are drifting on the ledge at a depth of 130 ft, encountering lots of rock, but whether of paying grade or not remains to be determined. The prospecting operations at the Keystone consist in running a tunnel west at a vertical depth of rooo ft from the surface. They are still a considerable distance from the point where the ledge matter is supposed to be. The face is in hard green-stone, and progress is necessarily slow. It will probably be some months yet before the ledge is reached. W. E. Stewart has got 80 tons of ore on the dump at the Lighthouse mine, near Butte City, and will commence crushing soon. Messrs. Nevills and Nichols have bonded the Moore mine, one mile south of Jackson, from Messrs. Bright and Newman for the sum of $15,000. According to the terms of the bond, $1,500 is to be paid on or before the 1st of April, the balance in one year's time. The bonders are not to have possession until the $1,500 is paid. Mr. Nevills left for the city early this week, and is expected back to-day or to-morrow. The Huntington roller quartz mill, at the Amador Queen mine in Hunt's gulch, was started Tuesday morning. It is supplied with Triumph concentrators. As both the mill and concentrators are new to this county we shall take an early opportunity of seeing them in actual working, and reporting thereon. Mr. Shugert informs us that the mill crushes 20 tons per day.

ENCOURAGING.—Amador *Sentinel*, Jan. 28: Wm. E. Stewart has been working the "Lightbouse mine" near the Mokelumne river, of late, and is meeting with most encouraging prospects. A tunnel is now run on the mine 63 feet, a lead of four feet wide showing in the face of the same. The slope which is now being worked is 60 feet long, and it is estimated that the entire body of ore in sight will pay $5 per ton, and it can be worked at an expense less than $2 per ton. A crushing of 150 tons of picked ore will shortly be made at the Matson mill.

WETZLAR.—Amador *Dispatch*, Jan. 28: The Wetzlar mine, owned by John Wetzlar and Martin White, still continues to produce rock of wonderful richness, and the proprietors are consequently happy. The Tellurium mine, near Pine Grove was sold at Sheriff's sale last Monday, to Lorenzo Arata, the price paid being $1,808.02.

Inyo.

BEVERIDGE DISTRICT.—Bodie *Free Press*, Jan. 30: In the gorges of the Inyo mountains, on the east side of the summit and just across from Owens Lake, is located Beveridge district. It, so far, has been mainly notable for having the Keynot mine—a property which has produced gold variously estimated at from four to five hundred thousand dollars. True, this amount has not been reported from the ores worked at the Keynot and Freetom canyon mills, but the aggregate sums taken out of the arastras and pounded up from the rich rock will reach close to the latter figure. The past winter down there has been so severe that communication across the Inyos has only been obtained by shoveling trails for ten miles through from five to fifteen feet of snow. Joe McDermott, formerly of Bodie and Benton, is now running the Freetom canyon mill and mines under great difficulties, but with increasing good prospects as the spring opens. A new strike of a big gold ledge in Hunter's canyon, near the steam arastra, is reported by the lucky owners—Messrs. Strauss and Miranda of Lone Pine—who talk strongly of putting up a five-stamp battery. Altogether the indications are good for this particular portion of our neighboring county's domain.

Mono.

NEW STRIKE AT THE SOUTH END.—Bodie *Free Press*, Jan. 30: For several months past Sutter, Barta, Kapff and Hoffman have been engaged in pushing a tunnel into Sugar Loaf mountain south of Queen Bee Hill and below the cottonwood wagon grade. They were stimulated to prosecute the work by the presence of a large quantity of porphyry and mixed occasionally with little stringers of quartz. At a point about 600 fect from the mouth of the tunnel a ledge four feet wide of free milling ore was struck tbe other day. The character of the ore is exactly identical with that of the Noonday and Red Cloud mines, except that it carries little or no base metal. It has a pure white, chalky appearance very much like Comstock rock, and will average about $35 per ton in silver and $4 in gold. Several assays were made showing $80 in silver and over $6 in gold. It has created considerable interest, as the conclusion is drawn respecting tbe South End and the advantage of resurrecting abandoned prospects.

Mariposa.

DILTZ MINE.—Mariposa *Gazette*, Jan. 31: Capt. Diltz came into town on Thursday and gave us an opportunity to interview him respecting his mine and its prospective outgrowth. We have from time to time referred to the hundreds of tons of ore already piled upon the respective dumps for milling purposes which has been taken from the main vein and the numerous strata and undergone the sluicing process of a wash during the rainy season when sufficient water could be obtained, and the great amount of gold realized therefrom. The extensively rich bank mining has induced ditches and reservoirs to be built with a view to ground sluicing principally, which has for many years paid so handsomely, that it has delayed the building of a mill as contemplated in the first instance. Outside of the true fissure vein, which of itself is abundant to justify the outlay of capital to erect mills with the necessary improvements to work the quartz, there abounds rich deposits of gold in the earth and vein matter. To show conclusively the extent of the mine and that it possesses a true fissure vein, five shafts of an average of 200 ft have been sunk at various points, which resulted most satisfactory to the owner. With a view to sinking another shaft the wash of tbe season thus far has been directed to uncovering the vein upon the south side of the hill where lies a large body of earth filled with quartz and other formations carrying gold in a variety of shapes. During the last two week Capt. Diltz has been using the limited amount of water which fell from the last rain to the best advantage. A new section of the vein has been uncovered which shows vein and vein matter, containing gold, some 25 ft wide and increases in width as it goes down. Much of the rock shows gold visible to the naked eye, with the earth and vein matter surrounding appearing richer in gold than ever before, since the Captain has owned the mine. Aside from the regular wash in the sluices, which have not been cleaned up, the Captain has, within the past two weeks, picked up specimens of pure gold, and of rock pounded out in a mortar, bas added to his fund near $3,000, a portion of which we had the pleasure of seeing. With a view to more extended operations in the future, two surveys for pipe lines, about two miles in length each have been made, which will convey ample water from an inexbaustible source for all purposes. This improvement will also open up acres of deep hydraulic mining in the same vicinity. These deep diggings have been known to pay as high as $12 a day to the hand when water could be had.

Nevada.

MACHINERY.—Nevada *Transcript*, Jan. 31: Geo. G. Allan has purchased the machinery from the old works of the Murchie mine and it is being hauled to his foundry. At the Pittsburg mine a small number of men are engaged in doing prospective work. A company consisting of H. G. Battey, B. F. Hartman, A. D. Sutton, M. Norton and A. Damon are running a tunnel in Canada Hill district to re-open the old Pillips ledge which is now known as the Caledonia claim. About 15 years ago the ledge was worked with good results to water level, when it was abandoned although good ore was left in the sbaft. The tunnel now being run will open the claim 90 feet below the old workings.

HORSESHOE MINE.—Grass Valley *Union*, Jan. 31: The shaft on the Horseshoe mine at Wolf creek, is being pumped out for the purpose of resuming regular operations. The heavy rains of December caused a suspension of work, but the company hope to be able to control the water during the remainder of the winter. When work was suspended there was good pay rock in the drift at the 100-foot level.

PENNSYLVANIA MINE.—Grass Valley *Union*, Feb. 3: A cleanup of 77 loads of rock was finished at the Omaha and Rogers' custom mills on Saturday, giving as a result a fraction less than $30 per load, not including sulphurets, which was very satisfactory. This rock was taken from the 175 ft level on both sides of the shaft. The vein on this level shows from 18 to 36 inches in size. The rock contains quite a percentage of high grade sulphurets. The prospects of the mine are considered as excellent, owing to the general good character of the quartz and the size of the vein. The mine is being worked regularly and intelligently under the direction of George Mainhart, who is an experienced and capable miner.

TO BE STARTED UP.—*Transcript*, Feb. 3: The last year the Manzanita hydraulic mine of this city was worked the clean-up was larger by several thousand dollars than during any season since it became the property of Owin Gowell & Co. When Sawyer's injunction was served (since which time no work bas been done) a fine body of gravel was struck which exceeded in richness anything ever seen in the mine. The owners bave been in a quandary to know what to do, but lately they have decided to work it by the drifting process and will commence operations as soon as the weather has become settled. A great many more men will be required to work the mine that way than by the hydraulic process, which will be a good thing for the town. It is believed that drifting will pay well in this instance, and if so, the Manzanita will be be exception to the hydraulic mines in the upper part of the country which have been closed down. A millwright says tbat judging from the number of applications being made for his services, there will during the coming summer be lively times in tbis and Washington mining districts. Three companies have talked with him about building quartz mills during the next six months, and he knows of still other claim owners who propose to make arrangements for crushing their own ore. Some miners have located a very rich quartz ledge near tbe site of the old Florida House, two or three miles north of the Mountain House. Quite a number of men are working in tbat vicinity with good results. It is rumored on the street that one of the big mines in this vicinity will soon be sold by its present owners for a large sum of money. There has been no talk until quite recently of the sale of the property in question.

Sierra.

THE YORK MINE.—Sierra *Tribune*, Jan. 31: One would hardly imagine that times were dull after going up to the York mine and looking around for a while. Everybody tbere is busy, and each man is at his particular occupation. Perfect order and system is noticeable, and nothing is left undone to make every dollar count to the advantage of the company. The new ten-stamp mill is running splendidly on good-looking ore. An upraise is being made on a pay chute 90 ft in from the mouth of the tunnel, and the tunnel is being driven ahead towards chute number two which is about 100 ft beyond the first one, as demonstrated by work further up the mountain side. The ledge is from 2½ to 3 ft thick and large quantities of ore can be extracted at a comparatively small cost. John Berry, of Nevada City, bas charge of the mill. John Skewes, of Grass Valley, is underground foreman and Jerome York is night foreman.

THE INCLINE.—*Mountain-Messenger*, Jan. 31: Tbe Extension incline or "slope" was connected with the tunnel on top, the last of last week, and the appliances for lowering and raising cars will be completed by to-day or to-morrow. It is expected that in a few days everything will be in good working order, and taking out of gravel resumed. The inclined plane is 260 feet long, the rise being one foot in four, making the perpendicular rise 65 feet. The drum is two feet in diameter, and a half inch steel rope will be used. The breaking strain of this cable is 6,000 pounds and a safe working strain is 2,000 pounds, which is just about what it will be called upon to stand, lowering two loaded cars at a time. Mr. Alfred V. Larson informs us that he, in connection with persons from Camptonville, has located an exceedingly rich quartz ledge in the vicinity of the old Florida House, two or three miles north of Dan Cole's. Several persons are now at work upon the ledge.

Trinity.

AS GOOD OR BETTER.—Trinity *Journal*, Jan. 31: Recent developments in the East Fork district, which is less than half-way between Weaverville and New River, show its mines to be fully as good if not better than those of the last named district. New finds are being made frequently, even at this season and the older ledges are showing up splendidly as work advances. Weather permitting we shall visit tbe East Fork mines soon and give the readers of the *Journal* such an account of them as their merits may deserve.

MORE DISCOVERIES.—Frank Moor was in town Tuesday from East Fork and informs us that during the past week two new and promising ledges have been found in that section. The first is located on Barney gulch and was discovered by John Day, and the other on Rich gulch was located by a man named Abbott. Both lodes are said to be well defined and prospect "way up." East Fork promises to become one of the richest and most extensive quartz district on the coast. It is said that more paying rock is now in sight in that district than was ever before known with a like amount of work. It is a splendid field for prospectors.

WATER THROUGH.—A note from Supt. E. M. Benjamin of the Hayes Red Hill gold mines informs us that the water of Canyon creek was put through the pipe, across the suspension bridge, to the opposite side of Trinity river at 27 minutes past 1 o'clock on January 27th, and that he soon expected to commence active operations. Suggestions are made relative to a pack-train loaded with bullion and a branch office of Wells, Fargo & Co., all of which we hope may be realized. The owners and managers of this property are to be congratulated upon the success attending their labors thus far.

BRUNSWICK.—Report has reacbed here that the Cannon Ball mill on the Brunswick mine in French gulch district was started up last Monday. As most of the stock in the mine is held in this county, lively times are anticipated as soon as dividends are declared.

DEADWOOD AND EASTMAN GULCHES.—Cor. Trinity *Journal*, Jan. 31: About one mile and a half above the town of Lewiston you approach the mouth of Deadwood, which runs in a northeasterly and southwesterly direction. At the distance of three or four miles from its mouth you enter into the extensive rich belt where is situated the various mines that have paid such enormous dividends since their discovery. It is needless for me to mention the progress of those mines that have so long been in existence and yielded bullion so fabulously, but speak principally of those that are young and recent in this new and promised land of quartz. John E. Gibson, is the owner of the extension of the Black Bear, which is leased by Wm. Blagrave, who is extracting as rich ore as ever was found in the original Black Bear. Next comes Frank Balleau. His ledge in the shaft looks immense and will soon be tapped by a lower tunnel. Perhaps some one would be anxious to hear from Billy Lappin, the owner of the Boston mine. He gets out about 20 tons of ore every season. The lode is about three feet in width and pays well. Otis J. Collopy is the owner of the adjoining location which looks encouraging in every respect. He has ceased operations until spring, owing to inconveniences attached to the mine. Dr. A. F. Lambeth, ex-Supt. of the Brown Bear mine, still resides in Deadwood. He is held here in consequence of a prospect in which he is half owner. The mine looks well in every particular, but Mr. Lambeth wishes to dispose of his share in consequence of soon being called to take charge of the well-known Saint Anne mine in Mexico. Traveling northward over the dividing ridge you enter Eastman gulch, the hills of which look rich with formation that greatly sympathizes with that of Deadwood. On Shooter gulch (a fork of Eastman) are located Hulbert & Newman, who bave very recently extracted ore that goes into the thousands. It is needless for me to mention in particular all the mines and prospects tbat abound in almost endless numbers throughout the white pine hills of Deadwood and Eastman gulch. But, in conclusion, I will say that our country is as yet unprospected and only time will tell the tale of millions hidden beneath our soil.

DEPTH.—Trinity *Journal*, Jan 31: The Brown Bear mine, in Deadwood district, which has paid handsomely for several years past, yielded its best rock at about 350 feet below the surface and they are now getting good ore on the 400-foot level. In the Barted mine, Deadwood, owned by McDonald Bros. & Franck, the richest rock was taken out from about 200 feet deep and a shaft from that level has been sunk 80 feet without any indication of pay giving out.

NEW RIVER.—*Times-Telephone*, Jan. 30: From letters dated at New River, and people who bave come from there within a week, we ascertain that either in the mines, on Happy Camp hill or at Berry's there was less than six inches of snow, and that it was melting very fast. Prospecting operations have been but little retarded and recent developments in some of the locations are of the most encouraging character. The Mary Blane, Uncle Sam, Ridgeway, Hard Tack and Mountain Boomer owners are particularly enthusiastic. George Dean, who is superintending operations at the Ridgeway, is moving the ore to be crusbed in the Mountain Boomer arastra. Other claims owned by citizens of Eureka, are beginning to attract the attention of those who desire to invest.

Tuolumne.

WORKING UNDER A DWELLING.—Tuolumne *Independent*, Jan 31: We learn that a party of Chinamen have purchased, of George Hale, the ground under his dwelling and the lumberyard buildings, in Columbia, for mining purposes. The price paid is $3,000, the privilege being reserved of leaving the dwelling undisturbed for three years. Success in pocket-mining on Brown's Flat still continues.

NEVADA.

Washoe District.

GOULD AND CURRY.—*Enterprise*, Jan. 31: All work below the Sutro tunnel level has been discontinued, and the tracks, air pipe and the like hoisted out. They are now cutting out a joint station on the 1000 level of the Gould and Curry or Bonner shaft. When completed the Gould and Curry will run a north lateral drift to the Best and Belcher south line, when the latter will continue it through its own ground. Superintendent Lyman says: "The 1000 level has never been prospected in any direction by the Gould and Curry or Best and Belcher companies."

HALE AND NORCROSS.—The west cross-cut No. 2 on the 2800 level is still being advanced in solid quartz, which is metal-bearing and of a most promising appearance in every respect. It is expected that the ore streak found in No. 1 cross-cut will soon be encountered. A drift is now being run from the Chollar main west drift on the 3000 level to connect with the bottom of the main winze. As soon as this connection has been made all will be open to exploration from the 3000 level to the surface.

OPHIR.—The water is fast draining out from the old Mexican shaft and the surrounding ground on the 500 level. The north lateral drift on the 500 level is being advanced rapidly. It is being run along the west wall and will be continued through the Mexican and Union Consolidated ground. The company continues to extract considerable ore from the 250 level.

BEST AND BELCHER.—A joint Gould and Curry station is being cut out at the 1000 level of the Bonner shaft, and is nearly completed. From this the Gould and Curry will run a north lateral drift to the Best and Belcher line, when the latter company will take the drift and extend it through their own ground.

COMBINATION SHAFT.—The new hydraulic pump on the 3000 level is now running very smoothly and well, thoroughly doing all the work required of it. The main west drift on the 3000 level of the Chollar has been stopped, and a branch drift started directly toward the bottom of the Hale and Norcross winze.

SIERRA NEVADA.—The mine has been dismantled below the Sutro tunnel level. Preliminary operations have been commenced on Cedar Hill in the old Sacramento ground, and work will be started at other points in the same locality.

SAVAGE.—The E-street tunnel is passing through the old stopes, but it is slow work, as the ground is a good deal caved. They expect to find ground containing low-grade ore that will pay for working.

YELLOW JACKET.—The old upper levels still continue to yield a large amount of low-grade ore, which is sent to the mills on the Carson river for reduction. Explorations are being made in various parts of the mine.

CROWN POINT.—A large amount of low-grade ore is being extracted and sent to the mills on the Carson river. A considerable amount of prospecting is being done at various points for the purpose of opening out new deposits.

CON. CALIFORNIA AND VIRGINIA.—Good progress is being made in the work of repairing the main drift on the 1550 level, and some preparatory work is being done at other points in the old workings.

MEXICAN.—A drift running north from the Ophir on the 500 level is nearly completed. The drift is for the purpose of exploring ground passed by in early days.

BELCHER.—They are extracting the usual amount of low-grade ore and shipping it to the mills. A large amount of good paying ore is still in sight.

UNION CONSOLIDATED.—A drift has been run north from the Ophir on the 500 level which will open up a large area of ground hitherto unexplored.

Bernice District.

A PROSPEROUS CAMP.—Cor. Reno *Gazette*, Feb. 2: Bernice mining district is creating a stir in this part of the country. Bernice is 70 miles to the southeast of Lovelock and is reached only by private conveyance. The Crown Prince contains three tunnels at a distance of 100 feet from each other up the hill, and averaging 400 feet in length. In these tunnels are 500 tons of fine ore ready to be taken out

without deadwork, and an estimate of how much more lies behind it cannot be made. We were shown the essaying receipt of Peterson & Co., of San Francisco, for eight bars of bullion; they ran from 902 to 961 fine. As 900 fine is mint coinage, we can form an idea of what kind of bullioo Beroice produces. The assayers claim it to be the finest silver shipped from Nevada. The five-stamp mill oow on the ground is running night and day, and the prospects warrant the owners erecting a ten-stamp in the spring. The Crown Prince employs a force of 70 men at present, and as this force can easily keep the machinery in motion, we would not advise any person seeking employment to go there for it.

Columbus District.

MOUNT DIABLO.—*True Fissure*, Jan 30: The north crosscut on the sixth level is now in 143 ft, and the west drift on the same level is in 91 ft. The west drift on the fifth level has been extended 10 ft during the week, and has shown 18 inches of $50 ore for the distance, the face still looking promising. The raise from this drift is up 57 ft and shows some $50 ore. A winze has been started from the fifth level, near winze No. 1 on a small streak of $60 ore. The intermediate drift between the fourth and fifth levels, that is being driven to connect with raise from the fifth level, has now 55 ft to go. Some $40 ore is being taken from the fourth level, and some ore of good grade is being stoped from between the third and fourth levels near winze No. 4. The stope east of the shaft, between the second and third levels, is looking well and giving some ore of high grade. The stope west of shaft, between the same levels, is yielding considerable $60 ore and looks promising. The various stopes in the upper part of the mine are looking about the same and are giving some ore of fair grades. The team began hauling ore on the 28th inst, and the mill will start up in about a week.

Cottonwood District.

NICKEL AND COBALT MINES.—*Silver State*, Jan. 31: The Cottonwood nickel and cobalt mines in Cottonwood canyon, Churchill county, a little south of the Humboldt line, are attracting the attention of French capitalists. The mines in that section, owned by George Lovelock, are bonded to San Francisco men, who are negotiating with Frenchmen for their purchase. One of these mines have been worked somewhat extensively, and some 65 tons of the ore sent to San Francisco sold for over $100 per ton. The ore is more valuable for the cobalt than for the nickel it contains, as cobalt is used for various purposes, and the principal mines of that ore are in New Calladonia, a French penal colony in the South Pacific. Yesterday Professors Keyes and Hirsh, two noted mining experts, arrived at Lovelock from San Francisco, and went to the mines to make a thorough examination of them.

Spruce Mountain District.

IN CAMP.—Eureka *Leader*, Jan. 27: Pat McBride who has for the past two months been at work in the new camp of Jasper, near the old mines of Spruce mountain, gives us the following information: The largest owner in the camp is Barney Harell, a wealthy cattleman, and with the help of Mr. Scherff, they have succeeded in opening up what promises soon to be a good camp. The mines are worked through two tunnels 700 feet in length. The ledge averages in thickness, from 12 to 14 feet, and the ore is of a medium grade, in appearance it is like the Richmond of this place. There is now on the dump at the mine 200 tons of ore, and up to a few days ago the company gave employment to 15 men at the mine. The distance from the mine to the furnace, is three miles, At the furnace there is 100 tons of ore ready to be smelted. The furnace is of 20 tons capacity, and gives support to quite a little town. The company has let a contract for the delivery of 50,000 bushels of charcoal and 500 cords of wood. It was the original intention of the company to have the furnace in operation the first of January, but the severeness of the weather prevented the supplies being furnished, and now the company will not start till the first of May.

ARIZONA.

HUMBUG.—Prescott *Courier*, Jan. 28: Representative Connell has a letter from Mr. Ensign, of Humbug mining district, in this county, in which it is stated that Smithline Bros. have 20 tons of $700 ore ready for shipment to Benson. Wager Bros. have arranged for the sinking of a 150-ft tunnel in one of their mines. Other owners of mines are taking out rich ore. Messrs. Church & Gray, mining engineers and assayers of Prescott, have engaged men to work a mine they own in Turkey creek districts. Tools and provisions were sent out yesterday. A note from Hon. A. W. Callen informs us of the fact that his men are taking out considerable gold near Walnut Grove. The Conger mill is crushing gold ore. A clean up will soon be made.

PLACER.—*Silver Belt*, Jan 30: John P. Chaffin and C. B. Philips have located a placer digging about three miles south of Globe and for more than a month have been engaged in taking out a ditch from Pinal creek, which when completed will be a mile and a half in length and carrying 30 inches of water. They believe so firmly that they have a rich claim, that they have hired men to assist in the work. It will probably be a month yet before the ditch is finished and sluicing can be commenced. Considerable gold has, from time to time been found in arroyos south of town.

CHIMNEY PEAK.—Arizona *Sentinel* Jan. 30: S. W. Fowler, of the Fowler mine Chimney Peak district, was in town last Monday on his way to Los Angeles in the interest of his mine. The Fowler mine as far as gone, shows up as well as any mine in the district, or in Arizona; is located about 21 miles northeast of Yuma, and the ore assays about $700 to the ton. Mr. Fowler has some specimens with him which he will have assayed at Los Angeles. Among other items he told us that the Rabbit mine, adjoining his, assayed equally as well. Mr. Fowler will return next Monday. He has Freeman Neahr associated with him, and they will develop the mine to its fullest extent before they will place it in market.

SILVER.—The Guadalupe mine in Silver district, is now being worked. Three men are constantly employed, and make about one shipment every two months to the Selby Smelting Company of San Francisco. The Guadalupe is owned by Paul Billeck, who is now adjoining in Yuma for a few days, Billeck & Vomoceli have discontinued chloriding at the Black Rock mine for the present. They have on hand 14 tons of galena ore which they will forward to the Selby Smelting Company in San Francisco, at once. Frank Vomoceli and Paul Billeck have re-located eight mining claims formerly belonging to the Castle Dome Mining Company, and are now prospecting them. Thos. Goodman was the lucky finder of gold bearing quartz about 12 miles back of Ehrenberg. The find is reported extraordinarily rich. Two ingots of silver bullion weigbing 305 pounds, and valued at $4,100, passed through this place for San Francisco last Wednesday. The bullion came from the Clip mine. A Yaqui Indian brought in $24.60 worth of gold dust last Wednesday the result of three days' work in dry placer mining, about four miles south of Gila City. The gold was sold at the rate of $18 per ounce.

OLD DOMINION COPPER CO.—*Silver Belt*, Jan. 31: Both of the company's furnaces have been in blast for a week and will continue to run as long as there is a supply of fuel on hand. There are now about 300 tons of coke in the bins at the smelter, and a large supply on the road, between Willcox & Globe, which will be arriving freely within a few days. All the ore from the Old Globe mine is now delivered through the tunnel, into the new bins, at least a quarter of a mile nearer to the smelter than formerly. By this change the company has been enabled to make a more favorable contract for the hauling of ore to the smelter. The new ore cars, six in number have been brought into use to fetch the ore from the mine. Three of them, with a capacity of two tons each, are fastened together and drawn by a mule to the trestle, where one man handles them and dumps the ore into the bins. Full shifts are now being worked in the mine, and the ore bodies look well. The prospect of a long run is certainly encouraging, as the Old Dominion Company is so important a factor in the prosperity of the camp.

GOOD RETURNS.—Lidolph & Co have received returns from 26 tons of Golden Eagle ore which was run through the Miami mill by S. Tidwell. The 26 tons yielded in gold $1,603.16. This is $61.66 per ton and is a remarkable result when compared with the battery sample which was $62. The Golden Eagle is one of the most valuable gold properties in this county. S. Klien & Co., will ship the bullion to-day to San Francisco.

COLORADO.

SPRINGDALE.—Cor. *News and Banner*, Jan. 30: This camp has been practically dead for the last five years. It is not really dead, but has been taking a long sleep, from which it begins to show signs of awakening. 'Tis said that every ten years brings a boom to a mining camp. Whether this is true or not, is immaterial. What we really do need is judicious development of the many promising mines, and prospects of the camp. Various causes have conspired against our mines. Owners unable to work their mines except in a small way, have held them at large prices; there has been much litigation; and there are no mills near by for the treatment of low-grade ores. There has been no deep mining done here; little ore except high-grade tellurium has been sold and most of the low-grade ore has gone into the dumps. In many cases the low-grade ore should be an important item of profit. Among the mines here which have been the largest producers are the Big Blossom, Ellen, Gladiator, Grand Central, J. Alden, King William, Rip Van Dam, Victor, Twin Blossom, Earl, Badger and Lily of the West. There is not a shaft on any of these claims that is more than 120 feet deep, and as near as I can ascertain some $40,000 has been taken out of their workings. There are many other claims, and various amounts of development upon them, but in my humble opinion $40,000 would more than pay for making every shaft, drift, adit and stope in Springdale.

AMONG THE MINES.—Georgetown *Courier*, Jan. 29: A new mining concentrator has been placed in the public ore market at Idaho. The Campbell smelting works at Idaho have shut up shop again, No funds to pay the workmen. About 15 men are employed in the Maine mine, nearly all of whom are in pay and some in big pay. The lessees on the Wolverine, who are driving the 500-foot adit ahead, have about 100 sacks of ore ready for shipment. Van Syckle & Co.'s lease on the Red Elephant is turning out some splendid ore, and is paying as well as any other on the mountain. Twenty-five or thirty men will be placed at work on the Summit mine in the spring. The work at present is confined to driving the tunnel. Between 200 and 300 pounds of float ore gathered near the Kirtley mine, was milled in Georgetown last Saturday, returning 1,670 ounces silver per ton, Husted & Co., on the Windsor lode, Empire, have between two and three feet of stamp-mill ore which runs well. The streak is improving with development. The new plant of machinery on the Joe Reynolds was put in motion last week. About 175 men are now at work on the properties and the production is steady. A contract is to be let on the Brittanica tunnel, Democrat mountain. The tunnel is in 375 feet and is run to cut the Muscovite lode. It is owned by Mr. T. W. Jones. Hensley & Co., lessees on the Range Line lode, Capital mountain, have a continuous vein of solid ore in the lower west level, from six to eight inches in thickness, which mills without sorting, 150 ounces.

IDAHO.

LOST RIVER NOTES.—Houston *Press*, Jan. 28: The Big Copper Mining Company are working quite a force of men, developing their property, and are taking out very high-grade ore. This property is showing up first-class and by spring there will be a large amount of ore accumulated on the dumps ready for the furnaces. The Grand Prize mine are pushing ahead with their work vigorously, and are extracting a fine quality of ore from the 130-foot level. On the Rio Grande gulch considerable work is being done on various mines by Jones, Ferguson and others and the mines in that section are looking well.

FROM BOULDER.—*Keystone*, Jan. 28: Messrs. Murdock and Stone, who went up to the Boulder mines Monday last, returned Thursday evening. They report that a number of relocations were made after January 1st, among them the Boston Run, formerly the Puzzler, was relocated by Chas. Schickran and John Hallett. They are at work on it, and it is already developing into a four foot ledge, and ten inches of clear galena. The Jessie and Ellen have also been relocated by the same parties. The Jessie has an eight-foot ledge of quartz and galena. The above named gentlemen will work all winter on their prospects. There are two men at work on the Belcher. A remarkable feature of the Boulder district is that there is no snow-slides above the mines, and never have been so far as known.

BULLION.—On Monday evening, four bars of Vienna mill bullion came in on the Vienna stage. They were numbered 235 to 238; bars 239 and 240 were on the stage following, and 241 last evening. The mill we learn from parties down in Vienna, is running with its same regularity, and doing well in the production of silver brick.

MONTANA.

FROM BANNACK.—Cor. *Inter-Mountain*, Jan. 27: Messrs. Howe & Selfridge are running a bedrock ditch at the mouth of Sage Brush gulch. They are now 20 ft deep, and expect to strike bedrock in another 100 ft. Rich tributary gulches were worked above them several years ago, and the prospects for another rich find are good. Beaverhead county is not half prospected, and in less than three years will prove to be one of the richest counties in Montana. S. H. Haps has 10 men working on Netta and Kent lodes, in Blue Wing district, and has out now ready for shipment over 400 sacks of good ore. The Bismarck Lode has been leased by Thomas Hancock & Co., and has a fine showing of right good ore. Cochran & Co, are hauling ore from their Lost Cloud mine, Elk Horn district, and have plenty of it. The Delmonte is a fine property and a steady producer of good grade ore.

BONDED.—Butte *Miner*, Jan 24: The Chattanooga is a fraction adjoining the Pacific Slope lode on the west and the Gambrinus on the east. The lead is a continuation of the Gagnon. The property is owned by Robt. McMinn, and was leased on Wednesday last to McNulty & Co. for 18 months, one-fourth of the ore extracted to go as royalty to the owners. The mine was also bonded for 8 months for $15,000 to the same parties. The main shaft is down about 90 ft, another down 45 ft and one about 14 ft on a 12-ft vein of ore, which assays about $19 or $20. The gold product of ore is about $7 per ton, the balance in silver and copper. This $19 assay is made from ore taken in the face, through rock and talc. The company will erect a new steam hoist and begin at once the sinking of a new double compartment shaft. The very richest specimens come from the mine, but so far no sorting has taken place. The Rock Island is owned by Steward & Hickey and has been prospected for some time. The main shaft is down 150 ft. A regular force of men are employed taking out ore and prosecuting development. They use a whim and will sink to the 200 ft levels. The average assay of ore now being extracted shows 60 ounces of silver. The Little Daisy owned by Mr. H. A. Kerns, of the New World mining district, is turning out some wonderfully rich gold, silver and galena ore. A tunnel has been run in 80 ft and will be driven to a full distance of 290 ft where it will tap the main vein at a depth of 250 ft. Three blind leads have been crossed in the 80 ft run, each going from 2½ to 4 ft in width and carrying the richest of ore, Mr. Kerns showed considerable of the ore yesterday and we find it abundantly covered with free gold which stands out prominently from the face. Sulphurets and galena are also readily discerned. Brittle silver and carbonate of iron is strongly noticeable in many pieces. Mr. K. has struck three other leads in the same vicinity and will open them all in the spring. Every one who returns from this new camp, whether successful or unfortunate speak in the highest terms of its splendid future.

NEW MEXICO.

GOLD HILL.—*Advance*, Jan 27: The Gold Hill claims show up as folllows: Powhattan, Hood and Doane, have a claim that runs $100 in gold, with two tons of ore on the dump. The Grover Cleveland, owned by Winters, shaft 10 ft, black sulphurets and chlorides, assays $800. The Homestead claim of McCone, Keister & Hargrave, with 13 ft of work, runs over $100 in gold and silver. Ringgold claim, McCone & Keister, have a 30 ft cut 8 ft deep that mill runs $78 in gold and $8.28 in silver. Winter's claim, owned by Clair, Classen and Kellum, have a 25 ft shaft and 1 ft ledge that runs over $100 in gold. Schneider, Hart & Co. own the Early Morning and Ruby claims. Shafts on each 6 ft deep, show rich metal that runs $200; ledge 2 ft and improving. The Reservation, owned by Sterling & Cunningham, has 2 shafts on it, respectively 18 and 8 ft. Assays in this claim run as high as $800 in gold and silver. There have been a dozen miners in from Gold Hill this week for ore sacks. There will be 1,000 tons of ore hauled here for shipment from Gold Hill in less than two months. The Yankee Girl, owned by Goodwin & Co., 20 and 10 ft each, with leads 1 ft in width, mill runs over $190. Have a carload sacked ready for shipment; ore rich sulphurets, chlorides and native silver. The Grand Tower, Lewis & Cottrell, near the pass between Lordsburg and Silver City, are sacking ore from croppings. The claim shows good mineral assaying from $100 to $1,000; ore manganese, horn and native silver.

GENERAL NOTES.—Silver City *Enterprise*, Jan. 31: The hoist and other machinery for the Old Man mine arrived in town on Saturday last and will be placed in position as soon as possible. An enlarged force of men will then be put to work on the mine. Williams brothers and E. G. Shields have a carload of first-class Sherman ore ready for shipment. The lower grade ore from this property will be concentrated at the works in this city when they start, if satisfactory arrangements can be made. It is reported that Capt. M. Cooney has perfected arrangements to erect a 10 or 20-stamp mill upon his property in the Mongollons. J. D. Caughran, president of the company, is now in Denver arranging for the purchase of machinery. Joe E. Sheridan on his new location on the Slayback, in the Mongollons, has six to ten feet of quartz that runs from $18 to $36 per ton in free gold is trying to make arrangements to build a mill of large dimensions to mill it. It is free milling and can be mined and milled for five dollars per ton, so that ten dollar rock will return a large profit. The Milwaukee company which has been operating in the Tres Hermanas, under the management of Mr. Fletcher, has at that gentleman's instance put up a furnace to reduce the ores of the camp. It has just been completed and is of the "Serpentone" pattern, being nothing more or less than the old-fashioned Scotch hearth, with an inclined reverberatory chamber leading upward from it to the stack, a distance of about 15 or 20 feet, as near as the writer can remember. The Hancock mine, in Tres Hermanas, which until lately was the property of Messrs. Meredith & Allman, of this city, has passed into other hands. E. G. Shields and Williams brothers are working five men on the Sherman mine and are taking from four to five tons of ore a day. This mine is probably one of the best showings in Grant county to-day. About 14 feet south of the main shaft on the tunnel level there is a body of fine chlorides or horn silver that will average $250 per ton. The ledge is about six feet wide, carrying horn silver. The late discoveries of additional immense ore bodies in the mines at Victorio have greatly increased the value of ore shipments from that camp. Both of the companies operating there are producing large quantities of a splendid grade of carbonate ore, and from the amount in sight it is safe to predict that the present shipments can be kept up for a long time. Never in fact since the discovery of mines has the ore outlook been so flattering. Vast bodies, many feet in hight, and from 15 to 20 feet thick in many places are exposed while the development work is adding fresh reserves to those now being drawn upon. Last year the product of the camp amounted to $275,000, but the yield for 1885 promises to reach if it does not exceed a half a million. For a place about which so little is heard Victorio is a marvel. The camp since its commencement as a producer of ore has excelled any individual camp in the county.

OREGON.

PLACERS AND QUARTZ.—Jacksonville *Times*, Jan. 31: T. J. Keatts and C. J. Armstrong have located a promising quartz ledge in Willow Springs precinct. Considerable prospecting is being done in this region, as our quartz interests are again attracting some attention. Ingram & Dean are still at work, though their supply of water has diminished perceptibly during the past week. D. L. Curtis has leased the mining ground he purchased of the late Sam Bowden, situated on Jackson creek, to a Chinese company. Oscar Swacker of Foots creek informs us that the miners of that section have done some work, but need more rain badly at present. W. H. Benner & Co. of Willow Springs district have their mines in excellent condition for an extensive run and are doing some work. Considerable mining is going on in the Sardine creek district. B. F. Miller's mines are being worked this season by parties from this vicinity. McCullough & Co. continue to take out rich quartz from their ledge in Willow Springs precinct. We were shown a very fine specimen of it last Saturday. L. D. Montgomery has purchased Chas. Baer's interest in Levens & Co.'s mines in the Coyote creek district. Considerable work has already been done there. A. W. Sturgis, the indefatigable miner of Forest creek, has done considerable work already. He informs us that he recently completed a new piece of ditch, which affords him more water, Newell DeLamatter of Kirbyville, informs us that the miners of Josephine county have had an excellent run so far, but that the water supply is slacking up in many places at present. No doubt a good report will come from the mines of that section this season.

UTAH.

REVIEW.—Salt Lake *Tribune*, Jan. 30: The week has been rather stormy, with unusual depth of snow in the valleys, but this has made very little interruption or delay in the chief thoroughfares. The shipments of ore and bullion from this city for the week ending Saturday, January 24th, were as follows: One car of refined lead, 22,056 pounds; 7 cars ore, 199,230 pounds; 25 cars bullion, 544,666 pounds; total, 33 cars, 765,952 pounds. The receipt of bullion and ore in this city for the week ending January 28th, inclusive, were $94,402.06, of which $70,171 was bullion, and $24,331 was ore, an unusually high percentage of the latter to the whole. The week before the total receipts were $99,381.08, of which $78,549.08 was bullion and $20,632 was ore. The unfortunate burning of the Hanauer smelter makes a material shrinkage in the output of bullion; but when it begins anew, with increased capacity, its effect in the opposite direction will be still more marked. The Horn Silver is still shipping its usual quantity of ore to the smelters, and making the average amount of bullion; but it is piled up at the works instead of being shipped. The product of the Ontario for the week was 24 bars, of the value of $17,251.21; total for 1885 to date, $125,574.98. The Ontario opens the year with a monthly dividend of 50 cents per share, payable on the 26th inst., in New York, amounting to $75,000. This is the 103d monthly dividend of 50 cents per share, and brings the total of dividends up to $6,125,000. The Germania smelter produced ten cars of bullion, $22,849.85 cents during the week. Silver Reef sent up $8,560 in silver bars, of which the Christy produced four, valued at $6,850 and the Stormont one, $1,710.

STAR DISTRICT.—Southern Utah *Times*, Jan. 31: The Martin Bros. were in from Star on Thursday. They report mining in that district active. There are more men at work and prospecting than for many years past. The Don is being actively developed by its owners. Mr. Campbell has six men at work on the Moscow, the mine he recently bonded, besides a force on the Red Warrior. The Martin Bros. are doing profitable work on some of their mines. It is now confidently asserted that Mr. Campbell will shortly erect a concentrator and leeching works in Milford. If such be the case, it will be the means of creating a mining boom for Star, equal to, if not greater, than that of '72 and '73. With the proper facilities for the reduction of ores, Star is capable of supporting more men than any other district in Beaver county, not excepting San Francisco district, the seat of the justly famous Horn Silver mine. Pluck, labor and a little capital are all that is necessary to bring the state of things about. Bowen, Ormond et al. are doing satisfactory work on their mine, the "Don," in Star district. They are taking out some very rich carbonate ore. Bingham, Utah, the past year, witnessed an output of 25,000 tons. It is now an assured fact that the Comet mine, in Copper gulch, will be thoroughly prospected the coming spring and summer. The French company who own it, we understand, have placed $75,000 to the credit of the working capital, but long before the above sum is expended, the public will be prepared to hear that the Comet has been developed into a veritable bonanza,

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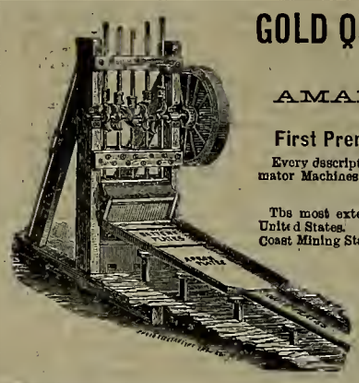

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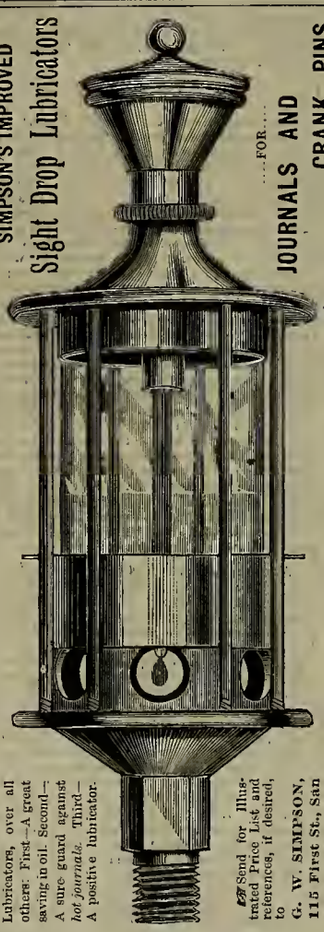

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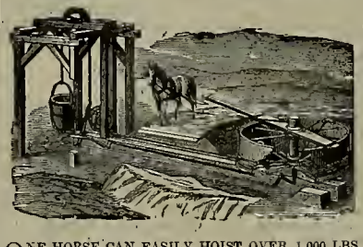

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DIVIDEND No. 20.—The Board of Trustees of this Company have this day declared the regular monthly dividend of fifty thousand dollars, being one per cent on the capital stock, or fifty cents per share, payable on January 9, 1885. W. VAN NORDEN, President.

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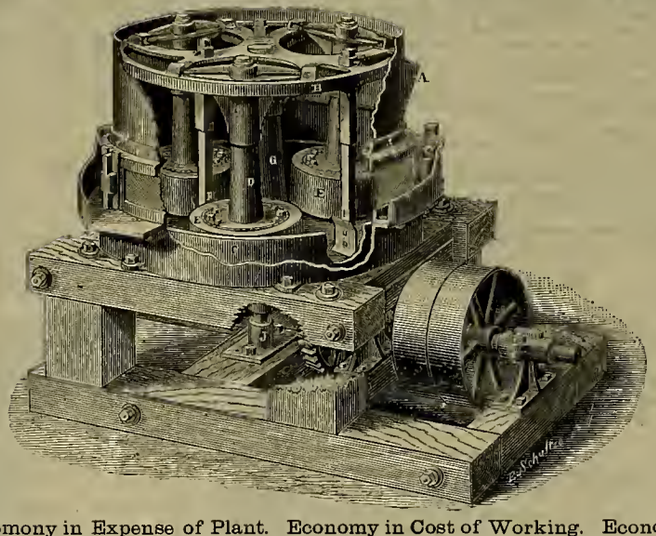

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The Silver Conventions.

When the "National Silver Convention" met at Denver on the 28th inst, there were over 1,400 people present, fully two-thirds of whom were delegates. Every county but two in Colorado was represented by large delegations and there were smaller delegations present from Utah, Wyoming, Idaho, New Mexico and Kansas. The first two days were taken up in organization business, and part of the meeting was rather stormy owing to the difference of opinion as to the permanent chairman. Governor Eaton was finally chosen. The majority report of the Committee on Resolutions was finally adopted and passed by unanimous vote. These resolutions are as follows:

The States and Territories of Kansas, Colorado, Utah, New Mexico, Idaho, Wyoming and Arizona in convention assembled at Denver, Colorado, January 28, 1885, adopted the following resolutions as a declaration of principles:

First—That we are in favor of the doctrine of himetallism as embodied in the laws of the United States previous to 1873, and we urge the re-enactment of those laws at the earliest practicable moment.

Second—That in the interests of trade and commerce we demand the free and unlimited coinage of gold and silver bullion at the present standard of coinage.

Third—We demand that Congress shall pass an act directing the Secretary of the Treasury to withdraw from circulation all one and two dollar bills, in order to give a larger circulation to the standard dollar.

Fourth—We condemn the Secretaries of the Treasury for their unlawful evasions of the provisions of the Bland hill, and demand that clearing-house balances and obligations of ths government be paid, without discrimination, in gold and silver or gold and silver certificates.

Fifth—*Resolved*, That it is the sense of this convention that the law amendatory of the national hank act be enacted, whereby said hanks throughout the United States shall keep not less than fifteen per cent of the legal reserves in national standard silver coin, and also the redemption fund of said hanks shall be in silver coin.

Sixth—That until Congress shall restore silver to its ancient rightful and constitutional equality with gold in respect to coinage, we demand a liheral construction and faithful execution of the provisions of the Bland hill.

Seventh—That the demands and recommendations about to be made are based on hroader grounds than any consideration of mere sectionalism or the protection of a particular industry; that there are well-nigh forgotten terms of that wise constitution and laws under which this nation has gained its place as the foremost people of the globe; that silver needs no such protection as is extended to the pampered industries of the East; that this question touches the dearest interests of every human heing in this hroad land, and that it involves the question of whether the deht-payiug medium of the nation shall be so changed as to increase the valus of notes, hond, mortgages and other fixed incomes, and depreciate the value of all other property and also involve the proper execution of our constitution and our laws.

H. C. Snyder, of Kansas, offered the following resolution, which was adopted:

WHEREAS, The material and commercial interests of the Southern and Western portions of this nation are of great importance to the prosperity of the whole nation, and

WHEREAS, The Secretary of the Treasury sways the financial power of the administration, and has seemed to possess power to almost nullify the acts of Congress, as is notably instanced in the manner in which the Treasury has been administered since the passage of the act known as the Bland silver bill.

Resolved, That the Silver Convention, composed of delegates from several States and Territories, of all political opinions and complexions, earnestly request President-elect Grover Cleveland to select some statesman for Secretary of the Treasury who will not be in the interests of the national banks and Eastern brokers, but will recognize the great interests of the South and the West in shaping the financial policy of the administration, and strive to promote the interests of the whole people instead of consulting the wishes of the magnates of Wall street.

A copy of the resolutions was ordered to he sent to President-elect Cleveland.

A committee appointed to consider a plan for a national silver association mads its report, which was adopted. It declares that the purposes of the association shall he the securing of such national legislation and aotion as will make effectual the recommendations and principles promulgated hy this convention upon the coinage of silver. The name of the orgauization shall he "The National Bimetallic Association." A preliminary committee of fifteen from the States represented was appointed to prepars a memorial address, embodying principles declared by this convention on the subject of the coinage of silver currency. It provides for a national committee, who are empowered to call a national convention, fix the basis of representation therein, and perform all the duties incident to their office. The preliminary committee is required to enter upon the discharge of its duties without delay. The convention adjourned siue die.

It was remarked that the great "Silver State" of Nevada was not represented at the Denver convention, hut that State has held a convention of its own at Carson, adjourning on Saturday night last. There was a good representation, and suitable resoltions were adopted. These we shall give in full in next week's PRESS. Immediately after adjournment the Nevada Silver Production and Reduction Association was organized by the election of the following named officers: C. C. Stovenson, President; Robert Briggs, Vice-President; A. C. Pratt, Secretary; Evan Williams, Treasurer; M. D. Foley, H. G. Parker, G. H. Thoma, Trustees; G. H. Morrison, T. J. Bell and J. Dennis, Finance Committee. Messrs. Foley, Liddle and Briggs were appointed a Committee on By-laws, whereupon the association adjourned, to meet at 1 P. M. on Saturday, February 7th. Thirty-one gentlemen signed the roll of membership. The initiation fee is $5 and the anuual dues $5.

Mining Share Market.

The stock market does not seem to have recovered from the announcement of the shutting down of all work in the lower levels of the north end of the Comstock. At the north end the Sierra Nevada Company expect to make a good thing from the ore veins possessed by the company at Cedar Hill. The Ophir, Mexican and Union Consolidated are running a drift on the 500 level, and intend to explore a large piece of ground that was neglected years ago. At the Best and Belcher and Gould and Curry they propose to explorea large tract of country on the 1000 level of the Bonner shaft. At Gold Hill and Crown Point, Yellow Jacket and Belcher mines are extracting ore sufficient to keep the mills on the Carson river busy.

Bullion Shipments.

Old Lexington, Jan. 27, $1,600; Alice, 27, $12,736; Lexington, 28, $19,568; Moulton, 28, $18,115; Alice, 30, $12,816; King, 31, $11,079; Alhambra mill, 31, $16,371; Barbers mill, 31, $5,733; Christy, 28, $1,950; Vienna, 28, $1,660; Crescent, 29, $2,800; Vienna, 29, $4,020; Christy, 30, $1,580; Wood River ore, 30, $3,447; Minnie Moore, 31, $3,200; Germania, 31, $4,533; Ontario, Feb. 1, $12,266; Germania, 1, $44,137; Stormont, 1, $3,250; Crescent. 1, $2,200; Idaho ores, 1, $3,900.

During the week ending January 31st, there were shipped from Salt Lake thirty cars of bullion, 660,588 pounds, and twenty cars ore, 549,480 pounds, making a total of fifty cars, aggregating 1,210,068 pounds.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will he called to this (as well as other notices, at times), by turning a leaf.

THE output of ths Drum Lummon mine at Marysville, M. T., is ahout $35,000 per week.

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ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alpha Con M Co	Nevada..	19..	50..	Jan 20..	Feb 26..	Mar 21..	W Willis	309 Montgomery st
Acme M and M Co	California .	8..	12..	Jan 14..	Feb 20..	Mar 13 .	J M Buffington	309 California st
Arnold M Co	Arizona..	3..	1 00..	Jan 3..	Feb 7..	Mar 2..	A Judson	320 Sansome st
Blue Bear M Co	California..	2..	25..	Dec 20..	Feb 20..	Mar 17..	W L Oliver	328 Montgomery st
Bulwer Con M Co	California..	1..	20..	Jan 13..	Feb 24..	Mar 31..	W Willis	309 Montgomery st
Butte Creek H M Co	California..	11..	10..	Jan 30..	Mar 9..	Mar 31..	R L Taylor	230 Montgomery st
Cueva Santa M Co	Mexico..	5..	25..	Jan 22..	Feb 27..	Mar 29..	W L Oliver	328 Montgomery st
Champion G M Co	California..	18 .	10..	Jan 28..	Mar 6..	Mar 26..	T Wetzel	522 Montgomery st
Caledonia M Co	Dakota..	15..	15	Jan 27.	Mar 9..	Apr 6..	W L Oliver	323 Montgomery st
Con Virginia and California	Nevada..	2..	20..	Jan 15.	Feb 20..	Mar 21..	A W Havens	309 Montgomery st
Copper Mt Con M Co	California..	1..	05..	Dec 3..	Jan 13..	Feb 10..	A L Perkins	310 Pine st
Eintracht Gravel M Co	California..	17..	05..	Dec 9..	Feb 7..	Feb 16..	H Kuntz	203 Sansome st
Excbequer M Co	Nevada..	21..	20..	Jan 2..	Feb 5..	Feb 26..	C C Elliott	309 Montgomery st
Hazard G M Co	California..	6..	05..	Jan 21..	Feb 23..	Mar 28..	J T McGrogbegan	318 Pine st
Happy Valley Gravel M Co	California..	5..	08..	Dec 15..	Jan 21..	Feb 9..	D M Kent	318 Pine st
Independence M Co	Nevada..	14..	13..	Jan 21..	Mar 2..	Mar 30..	J W Pew	310 Pine st
Martin White M Co	Nevada..	19..	25..	Jan 15..	Feb 25..	Mar 25..	J Scoville	309 Montgomery st
Mammotb Bar M Co	California..	7..	10..	Jan 19..	Feb 20..	Mar 13..	J W Pew	310 Pine st
Mayflow-r Gravel M Co.	California..	28..	10..	Jan 20..	Feb 27..	Mar 20..	J Morizio	328 Montgomery st
North Gould & Curry M Co	Nevada..	8..	05..	Jan 12..	Feb 13..	Mar 2..	C H Mason	331 Montgomery st
Peer M Co	Arizona..	2..	50..	Jan 14..	Feb 19..	Mar 16..	Waterman	328 Montgomery st
Peerless M Co	Arizona..	3..	50..	Jan 14..	Feb 18..	Mar 14..	A Waterman	309 Montgomery st
Potosi M Co	Nevada..	17..	25..	Jan 27..	Mar 2..	Mar 24..	C L McCoy	309 Montgomery st
Savage M Co	Nevada..	62..	50..	Feb 2..	Mar 6..	Mar 26..	E B Holmes	309 Montgomery st
Summer Con M Co	California..	2..	05..	Dec 18..	Jan 19..	Feb 12..	F E Luty	330 Pine st
Silver Lining M Co	Nevada..	1..	07..	Dec 16..	Jan 24..	Feb 19..	J. Stadfeld	419 California st
Silver Hill M Co	California..	21..	15..	Jan 9..	Feb 9..	Mar 6..	W E Dean	309 Montgomery st
Utah S M Co	Nevada..	52..	50..	Dec 19..	Jan 26..	Feb 14..	G O Pratt	309 Montgomery st
Virginia Creek Gravel Co	California..	1..	20..	Dec 20..	Jan 25..	Mar 2..	J M Quay	406 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Copper Mt Con M Co	California..	A L Perkins	310 Pine st	Annual	Feb 16
Holmes M Co	California..	O T Bridge	224 California st	Annual	Feb 10
Murchie M Co	California..	W Letts Oliver	328 Montgomery st	Annual	Feb 17
Prospect M Co		H P Bush	431 California st	Annual	Feb 10
Real Del Castillo M Co	Mexico..	J McGlenen	320 Sansome st	Annual	Feb 12
Saratoga M Co	California..	M Hubbard	123 California st	Annual	Feb 16
Villagrara M Co	Mexico..	J McGlenen	320 Sansome st	Annual	Feb 12
Wide Awake M Co		C Hildebraut	320 Sansome st	Annual	Feb 11

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California..	B L Burling	328 Montgomery st	50	Dec 5
Contention Con M Co	Arizona..	D C Bates	309 Montgomery st	25	Dec 15
Derbec Blue Gravel M Co	California..	T Wetzel	522 Montgomery st	10	Oct 8
Jackson M Co	California..	D C Bates	309 Montgomery st	10	Dec 27
Kossuth M Co	Nevada..	C K Sturtevant	328 Montgomery st.	06	Mar 16
Navajo M Co	Nevada..	J W Pew	310 Pine st	25	Feb 13
Paradise Valley M Co	Nevada..	W Letts Oliver	328 Montgomery st	10	Nov 28
Silver King M Co	Arizona..	J Nash	328 Montgomery st	25	Jan 15
Syndicate M Co	California..	J Stadfeldt	419 California st	10	Nov 6

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Jan. 15.		WEEK ENDING Jan. 22.		WEEK ENDING Jan. 29.		WEEK ENDING Feb. 5.	
Alpha	.45	.50	.25	.30	.10	.15	....	....
Alta	....	.30	.25	.30	.25	.30	.27	.30
Andes	....	.10	....	.10	....	.10	....	....
Argenta	....	....	....	....	....	....	....	....
Belcher	.65	.80	.70	.75	....	.80	.75	.80
Belding	....	....	....	....	....	....	....	....
Best & Belcher	1.10	1.25	.55	1.25	.70	.90	....	.75
Bullion	....	.25	.15	.20	....	.10	.15	.25
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	....	....	....	....	.15	....	....
Bodie Con	1.95	2.10	1.90	2.05	1.90	1.95	1.90	2.00
Benton	....	.05	....	.05	....	.05	....	.05
Bodie Tunnel	....	....	....	....	....	....	....	....
Caledonia	....	.25	....	.10	....	.05	....	.10
California	....	.30	.10	.30	.10	.15	....	.10
Challenge	....	....	....	....	....	.15	....	.15
Champion	....	....	....	....	....	....	....	....
Chollar	1.75	1.95	1.25	1.95	1.15	1.45	1.45	2.75
Confidence	.75	.90	.75	.90	....	....	....	....
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	....	.30	.10	.30	.10	.15	....	.10
Con. Pacific	1.00	1.15	.90	1.85	.75	.80	....	....
Crown Point	.80	.90	.80	.90	.80	.85	....	.80
Day	....	....	....	....	....	....	....	....
Eureka Con	1.15	2.00	2.10	2.40	2.25	2.75	2.50	2.75
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	....	.05	....	.05	....	....	.22	.25
Grand Prize	....	....	....	....	....	.30	....	....
Gould & Curry	1.00	1.20	.50	1.15	.65	.70	.60	.90
Goodsbaw	....	....	....	.05	....	.05	....	....
Hale & Norcross	3.60	5.00	2.40	5.13	2.60	3.95	2.85	4.00
Holmes	....	4.75	4.50	4.75	....	4.65	....	....
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	....	.15	....	.10	....	....	....	.13
Martin White	....	....	....	....	....	....	....	....
Mono	1.25	1.55	1.05	1.45	1.05	1.20	1.05	1.15
Mexican	.40	.55	.25	.50	.30	.40	.35	.38
Mt. Diablo	3.50	3.60	....	3.75	....	....	3.50	3.75
Northern Belle	....	....	....	....	....	....	....	....
Navajo	1.75	2.00	1.65	1.80	1.60	1.70	1.40	1.65
North Belle Isle	....	.15	.10	.20	....	....	....	.15
Occidental	.90	1.00	.75	.90	.75	.80	....	1.00
Ophir	.40	.55	.25	.50	.35	.40	....	.35
Overman	.05	.10	....	....	....	....	....	.08
Potosi	.70	.90	.50	.80	.40	.50	.50	.85
Pinal Con	....	....	....	....	....	....	....	....
Savage	1.60	2.00	.90	2.00	.80	1.10	.85	1.65
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	.50	.65	.35	.70	.40	.50	.35	.45
Silver Hill	....	....	....	....	....	....	....	....
Silver King	4.00	5.00	....	4.00	3.50	4.00	....	3.25
Scorpion	....	.10	....	.10	.10	.15	.10	.11
Syndicate	....	.40	....	....	....	.45	.35	.40
Tioga	....	....	....	....	....	....	....	....
Union Con	.50	.65	.35	.60	.35	.45	.35	.40
Utah	.15	.50	.15	.55	....	....	.20	.55
Yellow Jacket	1.20	1.25	....	....	....	....	1.20	1.25

San Francisco Metal Market.

[WHOLESALE.]

SATURDAY, Feb. 5, 1885.

ANTIMONY—Per pound	@ —
Hallet's	12½@ —
Cookson's	13 @ —
BORAX—Refined	7 @ 8½
IRON—Glengarnock ton	23 00 @ —
Eglinton, ton	22 00 @ —
American Soft, ton	21 00 @ —
Oregon Pig, ton	— @ —
Clipper Gap, Nos. 1 to 4	25 00 @ 30 00
Clay Lane White	26 00 @ —
Shotts, No. 1	26 00 @ —
Refined Bar	3 @ ¼
Boiler, 1 to 4	5 00 @ 5 50
STEEL—English, lb	16 @ 25
Black Diamond, ordinary sizes	13 @ —
Plow	6 @ 8
Machinery	10 @ 12
COPPER—	
Braziers' sizes	— @ 25
Fire-box sheets	28 @ —
Bolt	22 @ —
Yellow Metal	14 @ 15
LEAD—Pig	3@@ 3½
Bar	5 @ —
Pipe	7 @ —
Sheet	8 @ —
Shot, discount 10% on 500 bag	Drop, ₱ bag. 1 85 @ —
Buck, ₱ bag	2 05 @ —
Chilled, do	2 25 @ —
TINPLATE—Oldcastle	5 25 @ 6 00
Charcoal	5 75 @ 6 75
Coke	5 25 @ 6 50
Roofing	6 25 @13 50
ZINC—German	9 @ 10
Sheet, 7x3 ft, 7 to 10 lb, less the cask	9 @ 10
QUICKSILVER—By the flask	33 50
Flasks, new	1 05 @ —
Flasks, old	85 @ —

Market Reports.

Lumber at Wholesale.

There is a fair demand for lumber, but no special changes in price. Quotations of cargo rates are as follows for redwood lumber, for delivery at San Francisco, Oakland, Alameda, Berkeley, Vallejo, Benicia, Port Costa, Martinez and Antioch:

ROUGH—No. 1 rough merchantable, $18; No. 2 (refuse) rough, $14; No. 1 rough boards (specified width, 10 inches and over), $19; No. 2 (refuse) do do do, $14; No. 1 rough lumber, surface one side, $21; No. 2 (refuse) do do do $18.

PICKETS—Rough square pickets, $12; rough pointed do, $14; fancy pointed do, $22.

HALF-INCH LUMBER—No. 1 ½-inch surfaced, board measure, $40; No. 2 do do do, $30; No. 3 do do do, $38; No. 4 (refuse) do do do, $32; No. 1 ½-inch battens, board measure, $40; No. 2 (refuse) do do do, $32; No. 1 ½-inch siding, 12 ft. and over, b m, $40; No. 2 (refuse) do do do $32; ½-inch siding, under 12 ft, $32.

RUSTIC—No. 1 Rustic, 1x10, 12 ft and over, $33; No. 2 do do do, $32; No. 3 do do do, $31; No. 4 Rustic, 1x10, $23; No. 5 (refuse) do do do, $21; No. 1 Rustic, 1x8, 12 ft and over, $31; No. 2 do do do, $30; No. 3 do do do, $29; No. 4 Rustic, 1x8, $26; No. 5 refuse) do do, $21.

CLEAR—No. 1 surfaced and rough clear, $32; No. 2 do do do, $31; No. 3 do do do, $30; No. 4 (refuse) do do do, $24; No. 1 surfaced and rough clear, 1x8 and 1x6, $30; No. 2, do do do, $29; No. 3 do do do, $28; No. 4 (refuse) do do do, $24.

[Dimensioned, Surfaced and Rough Clear (widths and lengths), 12 inches wide and over, add $1 ₱ M (on each correspondiug grade) to the above list price of "Clear."]

TONGUED AND GROOVED—No. 1 T and G, 1x4, 12 feet and over, $32; No. 2 (refuse) do do do, $24; No. 1 T and G, 1x6, 12 ft and over, $30; No. 2 (refuse) do do do, $24; T and G, 1x6, 7 to 11 ft, $26; do do, under 7 ft, $23.

TONGUED, GROOVED AND BEADED—No. 1 T, G and Beaded, 1x4, 1¼x4 and 1¼x6, 12 ft and over, $32; No. 2 (refuse) do do do, $24; T, G and Beaded, 1x4, 1¼x4 and 1x6, 7 to 11 ft, $27; do do, under 7 ft, $22.

ROUGH CLEAR—1x6 and under in width, and under 12 ft in length, $24.

[On a credit of 60 days, or a discount at the rate of 1 per cent per month for anticipated payments, and not less than 1 per cent per month added for extension of the same].

We quote cargo rates Pine—Merchantable Rough, $15 ₱ M; Flooring, 24.20; Stepping, $37 ₱ M; Redwood—Merchantable Rough, $18; Surfaced, $32; Rough Clear, $32; Rustic, $33; Tongued and Grooved, $30; Tongued, Grooved and Beaded, $32.

Lumber at Retail.

Retail quotations for pine, fir and spruce are as follows:

ROUGH MERCHANTABLE (ordinary sizes) to 40 feet long, per M ft, $22.50; Rough Merchantable, 1x8, Fencing, $22.50; do do, 1x4, do, $23.50; do do, 1x3, do, $24.50; do do, 1x4, odd lengths, $22.50; do do, 1x6, do $21.50; do No. 2, all sizes, $18.50; do Selected, $20.50; do Clear, other than for T and G and Stepping, $31.

[Rough Clear for T and G and Stepping $1 ₱ M less than price of kind for which intended.]

Dressed T and G Flooring, 1x6, No. 1, vertical grain, ₱ M ft, $38.50; Dressed T and G Flooring, 1x6, No. 1, $33.50; do do do, No. 2, $28.50; Dressed T and G Flooring, 1x3, 1x4, 1¼x4 and over, No. 1, vertical grain, $40.50; do do do, No. 1, $35.50; do do do, No. 2, $29.50; Dressed Stepping, No. 1, vertical grain, $42.50; do do do, No. 1, $37.50; do do do, No. 2, $28.50.

SPRUCE—Rough Merchantable, ₱ M ft, $21.50; do Clear, $35; Clear Dressed (shelving), $40; Pickets (rough) board measure, $20.50; Furring, 1x2, per lineal ft, 1c; Laths, 1 and 1½inch, ₱ M, $3.50; 1½-inch, $4.

[N. B.—For all sizes over 14 inches, and lengths over 40 feet, extra rates].

Retail quotations of Redwood are as follows:

ROUGH MERCHANTABLE—₱ M ft, $22.50; do Selected, $27.50; do No. 2, $18.50; Surface, No. 1 and Rough Clear, $40; do, 1x6, $37.50; do, No. 2, $30; Rustic, No. 1, 1x8, $37.50; do, No. 1, 1x10, $40; do, No. 2, $35; do, under 10 ft, $35; T and G Redwood, 1x4, 1¼x4 and 1¼x6, $40; do do, 6 inch, 12 ft and over, $37.50; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; do do do, No. 2, $30; do do, Beaded, 12 ft and over, $40; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; Half inch Surface, $22.50; Pickets, Fancy, $30; do, Rough, pointed, $20; do do, square, $17.50; Siding, ½-inch, $27.50; Battens, ½-inch, per lineal ft, 1c; Shingles, ₱ M, $2.50; Shakes, Split $14; do, Sawed, $12; Posts, per piece, 13c; Dressed Boards, ₱ M ft, $25.

On a credit of 60 days or less, or a discount of two (2) per cent for cash only. On all credits exceeding 60 days' time, not less than one (1) per cent per month to be added.

Under the rules of the Exchange, no "lump" sum will be given on any bill of lumber.

Nails.

We give the price list of the Pacific Iron and Nail Company.

FENCE AND BRAD.—10d to 60d, $2.90; 8d and 9d, $3.05; 6d and 7d, $3.25 4d and 5d, $3.50; 3d, $4.25; 2d, $5.50.

BARRELS.—¾ inch, $8.75; ⅞ inch, $5.75; 1 inch, $5.25; 1¼ inch, $4.50; 1½ inch, $4.25; 1¾ inch, $3.75; 1½ inch, $3.50.

LINING.—⅞ inch, $7.25; ¾ inch, $8.75.

TOBACCO.—10d, $3.25 8d, $3.50; 6d to 7d, $3.75.

CLINCH.—6d to 30d, $4.50.

SLATING.—5d, $3.75; 4d, $3.75; 3d, $4.50; 2d, $5.75.

FINISHING.—2d, 1 inch, $8.75; 3d, 1¼ inch, $6.75; 4d, 1½ to 1" inch, $4.50; 6d, 2 inch, $4.25; 8d, 2½ inch, $4.00; 10d, in ch and over, $3.75.

CASING AND BOX.—10d to 30d, $3.50; 8d, $3.75; 6d, $8.00; 4d, $4.25; 3d, $5.25.

FINE BLUED.—4d, $4.50; 3d, $5.75; 2d, $6.50.

CUT SPIKES.—All sizes, $3.00.

BOAT SPIKES.—All sizes, $3.50.

Each half keg 10 cents extra.

TERMS.—Note or acceptance at 60 days with current rate of Exchange on S. F., or a discount of 2 per cent for cash, if remitted within 10 days from date of invoice.

All accounts when due subject to sight draft without notice.

An abatement of 10 cents per keg will be allowed upon orders of 200 kegs or over.

Building Material.

Lime, per barrel, $1.50@$1.60. Plaster, $2.75–3.00. Eastern Plaster, $3.00–3.25. Rosendale Cement, $2.25–2.75. Portland Cement, $3.50–3.75. Fire Brick, per 1,000, $40 @ $45, according to brand; hard, $10.00@$12.00; red, $8.00@$8.50; soft, $7.50; face, $30.00.

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Feb. 5.

200	Alta	30c	700 Savage 1.00
250	Andes	10c	150 Union Con 40c
100	Bodie Con	1.95	AFTERNOON SESSION.
100	B. & Belcher	75c	100 Alta 25c
60	Belmont	35c	900 Chollar 2.00@2.10
200	Belle Isle	15c	150 Crown Point 80c
380	Chollar	2.60@2.65	150 Gould & Curry 65c
500	Con Va & Cal	10c	250 Hale & Nor 3.40
50	Crown Point	85c	50 Mono 1.95
100	Gould & Curry	70c	100 Mexican 35c
720	Hale & Nor	3.50@4.05	220 Navajo 1.40
50	Mono	1.10	100 Occidental 95c
670	Navajo	1.00	20 Sierra Nevada 45c
60	Occidental	80c	380 Savage 85@90c
300	Potosi	80c	50 Union 35c
200	Sierra Nevada	@45c	140 Yellow Jacket 1.20

HEALD'S BUSINESS COLLEGE, 24 Post St. S. F. Send for Circular.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING JANUARY 27, 1885.

311,235.—ROCK CRUSHER—A. G. & J. M. Dyer, S. F.

311,428.—HAND WEEDER—L. C. Hill, Myrtle Creek, Or.

311,351.—CORN PLANTER—G. H. Meyer, Santa Rosa, Cal.

311,272.—STEPLADDER—L. S. Tibbals, Mission San Jose, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SPREADER FOR THRASHERS.—Geo. W. Gould, Yolo Station. No. 316,671. Dated Jan. 13, 1885. The object of this spreader is to effect an even and regular feed of the unthrashed straw to the separator. It consists in the arrangement and combination of various devices.

HOSE COUPLING.—Samuel R. Hackley, Crockett's Station, Contra Costa Co. No. 316,672. Dated Jan. 13, 1885. This hose coupling consists in a tapering male coupling, and a corresponding tapering female coupling, spring latches or dogs in the latter, an annular groove in the former, with which the dogs engage, a packing ring on the male coupling and abutting shoulders on each.

ICE MACHINE.—John C. Kilton, S. F. No. 311,013. Dated Jan. 20, 1885. This invention consists of a tank, within which the freezing medium is contained; a series of wedge-shaped chambers formed within the tank, so as to be surrounded by the freezing medium without connecting with it, these chambers being widest at the bottom, and having relief-pipes for expansion and the discharge of condensed water. Certain details of construction are also covered by the patent.

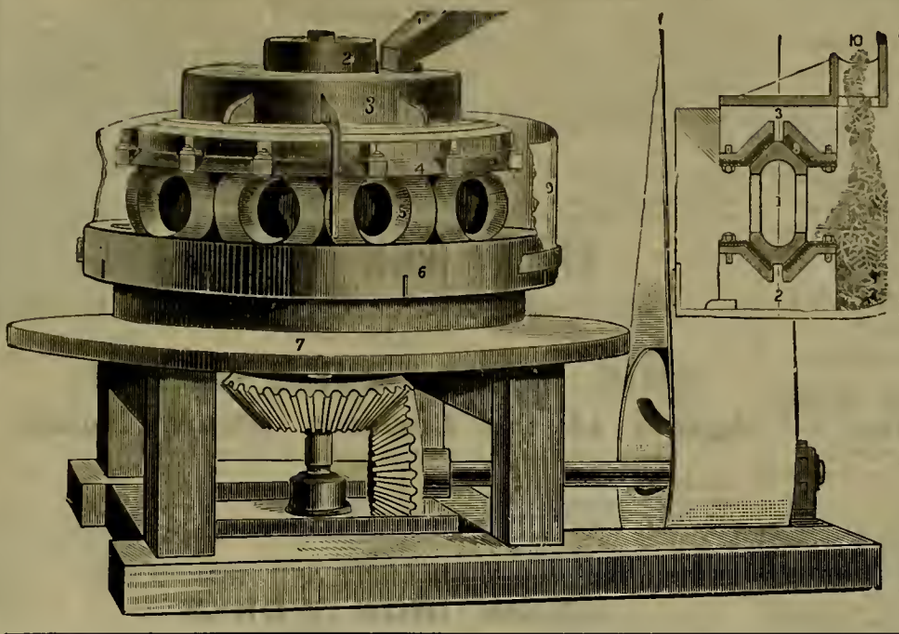
ROCK CRUSHER.—Aaron G. Dyer and James M. Dyer, S. F., No. 310,656. Dated Jan. 13, 1885. This is an improvement on cannon-ball crushers. There is a vertical rotating cone, supporting balls, grooved annular dies, a cylinder surrounding and resting on the cone and having its lower section diverging and corresponding with the exterior surface of the cone, and an independent guide shaft for said cylinder, arranged out of line with the cone-shaft in combination with a guiding chute or hopper, by which the material escaping between the cone and the cylinder is delivered between the balls and dies.

GUIDE FOR BORING DOORS FOR LOCKS.—Chas. F. Nichols. S. F. No. 316,710. Dated Jan. 13, 1885. This new guide for boring doors for locks consists in a frame having adjustable clamps for securing it to the door; in a laterally adjustable standard or rack-bar in the front of the frame, and in a vertically adjustable socket guide for the augur bit, said guide being carried by the rack-bar, and adapted by the lateral adjustment of the bar to the center of the bit, and, by its own vertical movement to direct the bit up and down; and in vertically and horizontally adjustable socket-guide on the side of the frame adapted to receive and direct the augur-bit to make the hole for the knot-shank and the key-hole. The object of the invention is to provide a simple and effective device for accurately boring the holes in a door to prepare it for the lock.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

HILL'S TRIUMPH ORE MILL.

THE KING OF Quartz Mills.



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Anti-Friction, Light Motive Power, Unequaled Results, A Low-Priced, Perfect and Economical Machine.

WORTHY OF INVESTIGATION.

SURE TO GIVE SATISFACTION.

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Inventor and Sole Owner

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☞Descriptive Circulars an Terms sent on application, personally or by letter.

ASSESSMENT NOTICE.

Fremont Mining and Milling Company.—Location of principal place of business, San Francisco, Cal. Location of works, Amador county, near Drytown, Cal.

NOTICE is hereby given that at a meeting of the Trustees, held on the twenty ninth day of December, 1884, an assessment (No. 1) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, No. 402 Front street, room 8, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the fourth day of February, 1885, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday the twenty-seventh day of February, 1885, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

MARK T. ASHBY, Sec'y.

OFFICE—No. 402 Front St., Room 8, San Francisco, Cal.

By order of Board of Directors, delinquency under above assessment is postponed to Wednesday, February 25, 1885, and the day of sale is postponed to Friday, March 20, 1885.

MARK T. ASHBY, Secretary.

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TESTIMONIALS.

SAN FRANCISCO, Sept, 19, 1884.

Risdon Iron and Locomotive Works—Gentlemen: We have had one of your Heine Patent Safety Boilers in use for four months at our Borax Works, in Alameda. It does good work and gives perfect satisfaction. Yours truly,

(Signed) WM. T. COLEMAN & CO.

SAN FRANCISCO, Oct. 4, 1884.

Risdon Iron and Locomotive Works—Dear Sirs: I am using one of your Heine Patent Safety Boilers in my Candy Factory on Twenty-Third street, near Valencia. For economy of fuel, safety and efficiency I have never seen its equal. Very truly yours,

(Signed) W. S. TOWNSEND.

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CHILLED CAR WHEELS.

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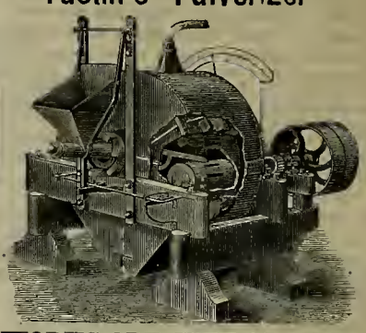

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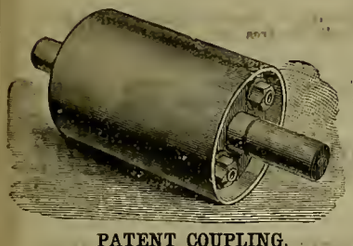

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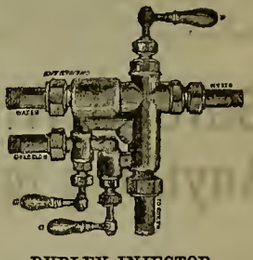

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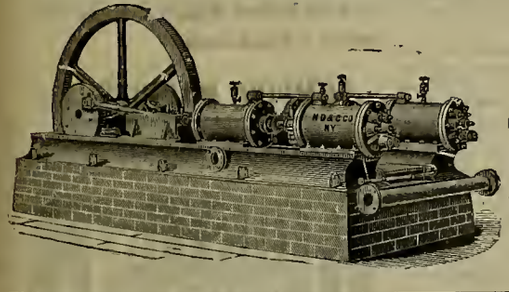

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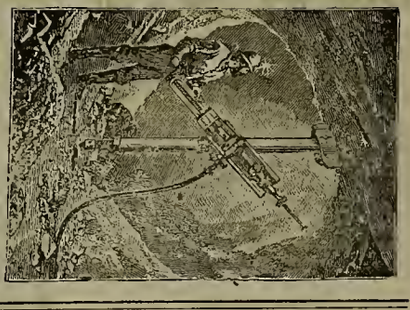

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, FEBRUARY 14, 1885.

VOLUME XLXX. Number 7.

Drilling in Cement.

In La Salle county, Illinois, are beds of hydraulic limestone which are very regular, and the ore worked by the Utica Cement Co. is 16 feet thick. There are two beds, separated by 18 miles of sandstone, but the two beds are worked as one, the sandstone being first cut out and removed to prevent mixture. The rock is obtained entirely by mining underground. Tunnels are driven in the cement-rock, and the interior plan is much the same as a coal mine, laid off in rooms with walls between, connected with the main tunnels or entrances by cross-entries. The rooms are worked 45 feet wide, with 15-feet walls between, the main tunnel having side-walls 25 feet thick. The mining has all been done with pneumatic drills. Mr. Henry C. Freeman, of Alto Pass, Ill., was in charge of the development of the property and designed the plans. In a paper he read not long since before the American Institute of Mining Engineers, describing the method of working, he gave some interesting details of the drilling operations.

After some experimental work, the plan settled upon for mining was to cut out the sandstone and remove it; then blow down the upper or main mass of the cement-rock; and, lastly, raise the two feet of cement-rock below the sandstone. But all the drilling for the face of either a tunnel or a room was done before a shot was fired. The method of working a room and tunnel was the same, and by preference the tunnel was driven wide—about 20 feet—as a matter of economy, excepting at the entrance, which was kept narrow, that it might be readily closed against severe winter weather, and also to lessen the action of frost on the roof.

The drilling commenced anywhere in the face, after the drillers became skillful; but the system indicated a beginning always in the center of the face, a few inches above the sand-stone, —one, two, or three drills occupying the face of a room together. Usually it was divided between two. Two holes were drilled, two and a half feet apart, about two and a half feet deep, and directed obliquely downward and forward, converging so that the two holes would be about four to six inches apart at the bottom, and terminate in the sandstone near the base. Two more holes, four and a half or five feet deep, were drilled like the first pair, starting three inches horizontally from them, and converging as before. A third pair of holes, three inches from the second pair, went in seven feet, and sometimes a fourth pair were put in nine feet in the same manner. These holes were always blasted in pairs, and in the order given, the first pair making a wedge-shaped opening, which the second and third pair deepened to the regular depth of breast, which was usually seven feet for the standard.

The Burleigh drill was used. In the beginning of the work, the "tunnel carriage" which the manufacturers sent out with the drill was employed. It was an unwieldy affair, requiring nine men to move it about, though two (the driller and his helper) were sufficient to use it. The unsuitableness of this carriage led Mr. Freeman to design a totally different one adapted to the work. The accompanying drawings and description exhibit this carriage, which is still in use. As it was not patented, it is free for public use. This carriage suited the work perfectly. It is also adapted for any tunnel-work of ordinary width for a railroad, and down to seven or eight feet wide, by making the carriage specially for narrow work. This carriage, with its drill (weighing together one ton), was handled very easily, either on or off the tracks, by the two men who did the drilling, a pinch-bar being used to shift it into position.

In the accompanying cut, Fig. 1 is a side view, with one end shown partly in section. The drill (not shown in the drawing) is clamped to the long horizontal bar in the usual way. This bar moves up and down freely between the guide-posts of the carriage, being suspended at each end by a chain. A lever working in the ratchet winds or unwinds the chain at each end. The two stancheons shown in position support the drill when in action, and are themselves supported against the floor and roof, and made secure by the long jackscrews in the bottom. A wooden cap is usually laid on top next the roof. On the floor is an iron plate for the screw-head.

Sets of clamps at each end of the drill-bar inclose the two stancheons; and a short jack-screw in each end of the drill-bar is forced out against the stancheon. The drill-bar is then independent of the carriage, and the chain may be slackened. *A* is an end view of the drill-bar looking downward. It shows the lugs that serve as guides on the posts, and the attachment of the clamps, bolted on. A short jack-screw is omitted in the figure. *B* exhibits half of the bottom-frame, showing method of framing and attachment of the posts. The frame is of seasoned white oak, the stanchions of Norway pine. For a ten-feet ceiling an eight-feet stancheon is a convenient length. They are eight inches square.

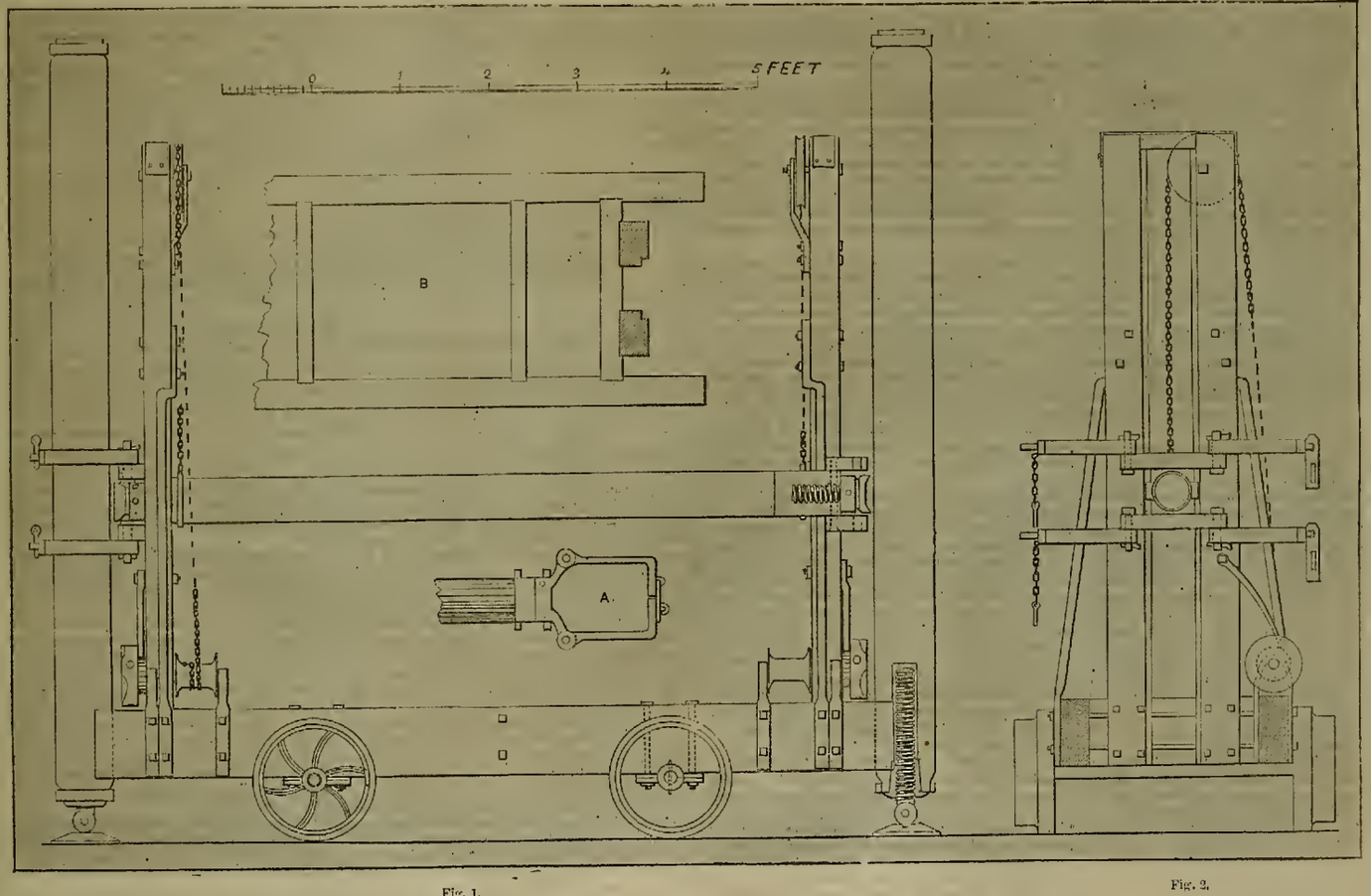

Fig. 1.

Fig. 2.

AN IMPROVED CARRIAGE FOR PNEUMATIC DRILLS IN MINING WORK.

Fig. 2 is an end view of the carriage, with the stancheons omitted and the clamps thrown open.

T rails were used; but as it was inexpedient to have a track close to the face, the flange of the wheel was broadened, so that the wheel had two treads, the lesser diameter to run on the rail, and the greater to run on the rock-floor. The construction of the track was unlike the common practice. Four by six-inch oak scantling, 14 feet long, was framed together by tongue and mortice, the six inch face flat, with three cross-pieces secured with wooden pins. These 14-feet sections were kept in stock, with a few half-lengths. It is a very convenient method for mine-tracks with light rail. The rail has a full bearing its whole length, and a lighter rail can be used.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS

New Mexican Mines.

EDITORS PRESS.—Mining matters in New Mexico have decidedly advanced during the year 1884. The general dullness of business in the East has, of course, affected us all more or less. It has been difficult to raise capital for any new enterprise, and the sale of mining property has been well-nigh impossible. But all mines which produced in 1883 have maintained or increased their production in 1884, and many owners of properties, half prospects and half mines, despairing of getting capital wherewith to inaugurate extensive operations, have made the best of the small means at their command in the development of their claims. In consequence, the number of small ore producers has notably increased, and the grand aggregate of New Mexican production has been swelled very considerably. The Cooney mine, in the Mogollon mountains, which produced $30,000 in 1883 produced $100,000 in 1884, and this without additional investment and with the same equipment of a five-stamp mill with two vanners. The Lake Valley companies have produced at the rate of $150,000 per month for the year. The Billing smelter at Socorro, which produced $267,000 in '83, ran its total up to $1,098,000 in 1884, this great production being mainly from its own mine, the Kelly, in the Magdslena mountains. During the year the Cabinet Mining Company, of St. Paul, Minn., purchased first the Torrence mine in Socorro mountain and the Torrence mill, in the city of Socorro; later they bought the splendid Merritt mine in Socorro mountain, and, in my judgment, the best body of milling silver ore in New Mexico.

They are treating now 30 tons per day of Merritt ore, with a net product of $1,000 per day. The Mogollon mines in the neighborhood of the Cooney, encouraged by the success of that mine, have developed energetically. During the past year, the Silver Bar No. 1 North, (Peacock Mining Company) Silver Bar No. 2 North, (Silver Bar Mining Company of St. Louis) Bismarck, Ocean Wave, Blue Bird and other properties, have become small shippers of high grade ores.

The mines at Kingston and Georgetown, near Silver City and Lordsburg, all either maintained or increased their productions. The gold mines of Lincoln county, near this place, increased their production from $24,500, in 1883, to $114,250 in 1884. With good machinery this increase might just as easily have been trebled.

At Los Cerillos, Naciemento, Gallinas, the Ladrones, Tinitlan, Tres Hermanos, Floridas, Bonito, Nogal, Clifton, Grafton, Fairview and Chloride, 1884, was a year of patient and persistent development, and nearly all these camps were small shippers of high grade ores, and in the aggregate to a very considerable amount. The dull years of 1883 and 1884 have forced New Mexican mining on to a legitimate basis. Success has been achieved in the face of deficient capital, debt and doubt. The prospects for the future are therefore bright. New Mexico will not long appeal in vain for capital necessary to the development or extension of any legitimate mining enterprise. She has become a steady producer of the precious and superior metals, and in a very few years may be expected to take her place alongside of Arizona, as a large one.

The coal mining interest in New Mexico, more than doubled its output in 1884. The coke interest more than trebled its sales.

New Mexicans have every reason to feel encouraged, and I may hope at the close of the present year to be able to give still more potent reasons for faith in their future prosperity.

D. J. M. A. JEWETT.

White Oaks, N. M. Jan. 26th.

The Richmond Furnaces.

It does one good these quiet times to visit the Richmond works, and there see the hustle and activity going on. At present, the company is employing some 170 men, all of whom are busy as bees at their various stations. The works are about the most complete to be found on the Coast, and the several departments are conducted with the most practical precision, much to the credit of the foreman, Mr. L. W. Davis. Considerable of the ore being worked is conveyed from the mining sections over a narrow-gauge railroad to the ore-bins at the furnaces. If a piece of machinery at any time breaks, a like piece is generally recast in their foundry, thus doing away with the delay and general inconvenience usually incurred in having to send East or to San Francisco for a fac-simile of the same, and their machine, carpenter and other shops are well equipped with not only the necessary appliances for the speedy and accurate performance of work, but they are supplied with thorough and intelligent workmen.

The various ores received at the works are all scientifically sampled, and their exact properties ascertained by Foreman Davis, who then orders the requisite quantities of each fed to the furnaces, in order to secure a successful reduction of the same. The principal properties in the ores to be ascertained before feeding them to the furnaces, in order to have them advantageously worked, are the litharge, lime, quartz and slag.

At present, three furnaces are running at full blast, two of which have a daily capacity of 50 tons, the other 60 tons. Aside from the ore being shipped to them from the Richmond mine, the following outside properties have made shipments since the 15th instant as follows: From Adam Hill section—Silver Lick mine, 22 tons; Members, 11; Oriental and Belmont, 16½; Herculean, 5; War Eagle, 5; King Lear, 6; Red Bank, 3½. Prospect Mountain—Lord Byron, 98, Excelsior, 5½; Tiger, 2. New York Canyon—Tiger Lily, 6. Ruby Hill—Jackson, 54.—*Eureka Sentinel.*

Arizona as a Gold Country.

Much is said and written every day of our Territory as a silver and copper producer, but little is heard of the immense deposits of gold, in placers as well as in veins, within its borders; in fact the whole Territory is a large placer claim. From as far east as the San Francisco river, where at the present time hydraulic mining is carried on with great success, to the Colorado, the intervening country abounds in placer mines, and the only, but very serious drawback to obtaining their treasures, is the scarcity of water. If this could be obviated, our Territory could vie with California in its palmiest days in pouring into the markets of the world a stream of the yellow blood of industry and commerce (with which, in utility, the blue blood of nobility is nothing in comparison).

In the Santa Rita mountains, the well-known Louisiana gulch has yielded large amounts of coarse placer gold, the quantity of which is only limited by the water supply.

Look at the old placers in the Quijotoa country, so extensively worked by Yaquis and Sonorans some fifty years ago, all done by the dry-washing method, when the yellow dross was carried by the mule load into Mexico. These same placers can only be said to be half worked out, however. Not only in these old grounds, but also in all the flats and ravines, gold is found in largely paying quantities.

The only drawback is want of water, and it can be had by boring; if not in sufficient quantities in the mountains, an abundance can be obtained in the valleys, from whence it may be forced to the proper place. Every valley in Arizona has an underground river.

From the Quijotoa mountains westward to the Colorado river placer gold and gold in quartz is found. South of Yuma are the Picacho gold placers and gold-bearing quartz veins. Out of these placers many and many a hateau has been dry-washed by the Mexicans, yielding from one to six ounces and more.

At Gila City, on the Gila river, large deposits of fine gold have for years been known to exist. Further north, around the celebrated Vulture mine, placer gold is found all over the country, and has been worked by dry-washings. To the northwest is a long and wide gold belt, of which old La Paz, now Ereuburg, is the center, and the quantity of gold taken from them is astonishing.

Eastward again comes the old placers on the Hassayumpa river, of which the most prominent are those of Weaver district, and notably Rich Hill, between Antelope and Weaver creeks, where the gold was found, when discovered in 1863, to lie exposed in nuggets from the size of a pea to several pounds in weight on the bare rock, fully 500 feet above the surrounding country. To the east are the Castle Creek placers, from which much gold has been taken.

On Lyon creek, near Prescott, nature furnishes the gold-hunter with water sufficient for working at least part of the year, and he reaps a good compensation for his pains.

We still have the Black Canyon diggings, known to be rich in gold, and in fact all over our Territory nature has scattered gold with a lavish hand.

Were water facilities in proportion to the gold found, the world at large would soon cease to complain of the constantly-diminishing of the precious metal.—*Arizona Index.*

PROFIT ON MINES AND RAILROADS.—Of all the vast array of corporations whose stocks are listed on the Exchanges of New York with thousands of millions of capitalization, only the following twenty-two of the active stocks pay dividends of over $500,000 per annum, to wit: New York Central, New York and New Haven, Chicago and Alton, Rock Island, Burlington and Quincy, Canadian Pacific, Omaha, Missouri Pacific, Harlem, Oregon Railway and Navigation, St. Paul, Minneapolis and Manitoba, Plymouth Gold, Horn Silver, Northwestern, St. Paul, Lackawanna, Ontario Silver, Western Union Telegraph, Pulman's Palace Car Company, Pacific Mail, Delaware and Hudson, and Illinois Central. The mining companies maintain a fair proportion. The Plymouth Gold and the Horn Silver each pay 12 per cent yearly on their full capital, being a higher rate than is paid by any of the above companies.—*New York Journal of Commerce, Jan. 23d.*

The Manhattan Mine.

The Result of a Year's Work.

The annual meeting of the Manbattan Silver Mining Co (Austin, Nev.) was held last week and the following directors chosen:

A. K. P. Harmon (president), M. B. Pond (vice-president), M. Curtis, B. O. Paxton, E. G. Gibbs. John Crockett was re-elected secretary, and M. Curtis superintendent.

The secretary reported the receipts and disbursements for the year as follows:

RECEIPTS.

From 5204 tons, ass'y, $231 50, val, $1,204,752 88 @ 93.70 46 per cent	$1,128,909 91	
Royalties collected on dump ores	1,788 57	
Gain—Losses of previous years collected	212 50	
		$1,130,910 98

DISBURSEMENTS.

Mining Expenses—Lander shaft mines	$ 228,271 65	
Paxton Inc mines	147,362 75	
Isabella Inc. mines	27,943 79	
Ruby Inc. mines	33,014 30	
Frost compressor & pump shaft	46,063 69	
N. Star pump shaft	2,329 85	
London Inc. mines	2,819 52	
Silver Wedge mines	5,573 68	
Ward Inc. mines	3,087 35	
Low grade ores	9,120 43	
Lone Star mines	11,090 29	
Blue Inc. mines	18,561 31	
Bowman Inc. mines	4,273 48	
Great Eastern mines	3,362 61	
S. F. Tunnel mines	820 55	
Mining Prospect	4,776 98	
Improvements, real estate and properties	68,878 55	
Mining Expenses—reducing 5,204 tons @ $25,392 per ton	132,140 58	
Furnace Royalty on 4514½ tons @ $1 per ton	4,514 50	
Bullion Discount on Manhattan ores	182,175 29	
On custom ores (over collections)	2,408 00	
Custom ores—purchase of 471 tons	88,453 38	
Texas	15,633 69	
Interest	887 40	
Exchange	6,501 45	
Expense	6,324 87	
Insurance	2,823 84	
Mill repairs	10,924 84	
Losses	2,532 00	
		$1,072,002 60
Profit for year		$ 58,248 38

From the report of Melville Curtis, the superintendent, we make the following extracts:

During the year the mill was in operation nearly ten months, being shut down for March, April and a part of September. The amount of ore reduced was 5,204 tons, giving an average assay of $231.50 per ton, and producing $1,128,909.91 in bullion.

The improvements made on the property, etc., amount to $62,882.91.

The Austin City Railroad has hitherto delivered all wood, timbers, lagging, etc., at the mill, which is the terminus of that road. The cost of hauling from this point to the several mines was a very heavy item of expense, and it was determined to economise in this department by building an extension of the above named road to the mines. This was accomplished at an expense of $11,735.78, and now all fuel and mining supplies are delivered where wanted without breaking bulk. This effects a great saving, which will, in a short time, pay the cost of the road.

In order to complete the railroad system, a tramway was built from the Frost to the Lander shaft. This is 1,000 feet in length, with all necessary switches and side-tracks, surmounting in that distance a perpendicular height of 277 feet. It is operated by a steam donkey-engine, situated at the Lander shaft. The cost of this plant was $3,366.46.

Until recently, nearly all the work done in Lander shaft mines has been by day's pay. The Farrell ledge, on which much work was done previously, has been worked during the entire year, yielding a large quantity of rich ore.

The Oregon ledge, below 600 foot level, is being extensively worked. The 600 incline has been sunk to the 700 level; that level extended 567 feet west, and connected with the 600 incline, and is being pushed still beyond that point. A body of high grade ore was uncovered between the 600 and 700 foot levels, a large part of which has been stoped out, but considerable ground still remains to be worked. The product of this ledge for the year was 343 tons, giving an assay value of $107,991.18. On the North Star ledge, 800-foot level, a drift was run east 331 feet, but failing to find any bodies of ore, was discontinued. There was taken from this ledge during the year 50½ tons of ore; assay value $17,704.09.

The work performed in these (Lander shaft mines), including tribune work, consists of 87,275 square feet of stopes, or breasts, 2,996 linear feet of drifts, 1,658 feet of crosscuts, 885 feet of inclines and 323 feet of chutes.

The total product was 2,287½ tons of ore, assaying $262.72 per ton, and giving in bullion $561,034.98.

Most of the work done in the Paxton incline mines on company account was below the 1,500-foot level. The 1580 and 1680 levels were run east 147 and 437 feet respectively, and connected with the Lander workings. The greatest portion of this ground was stoped out, and leasers are now breasting out the remainder.

On the 15,000 level a cross-cut has been run south 315 feet, cutting the Alabama ledge at 100 feet. This crosscut will be continued until it reaches the Oregon ledge, which it will do at a point several hundred feet west of our present workings on the 700 of the Lander, and open a considerable quantity of ground which has never been prospected. The work in these mines (Paxton incline), including tribute work for the year, consists of 64,550 square feet of stopes, 3,044 linear feet of drifts, 485 feet of crosscuts and 259 feet of incline. The product was 1,151¾ tons, assaying $203,445.85 in bullion.

The machinery at the Frost pump and compressor shaft has hitherto been used only for compressing air to supply all the mines, but during the last summer heavy 10-inch Cornish pumps were added, doing away with the use of the steam pumps which were used at the North Star pump shaft. This has effected a great improvement, as these pumps handle the water from all the mines with ease and at less expense for labor and fuel.

The Ruby incline mines were worked entirely upon the tribute system. Much new ground was opened, with, in some instances, very good results. There yet remains a large amount of unprospected ground accessible to tributers. The work for the year was the extraction of 12,300 square feet of stopes, 1,078 feet of drifts, and the product 165½ tons of ore, assaying $341.56 per ton, and yielding $53,541.57 in bullion.

The Isabella incline mines, like the Ruby mines, were worked entirely by tributers. The work accomplished was 9,450 feet of stopes, 1,336 feet of drifts, and the product 129 tons; assay, $287.68; bullion, $34,852.14.

Low-Grade Ores.

The system adopted in the latter part of 1882 for working these ores has been continued since, with gratifying success, and is found to be the source of a reasonable profit, as well as bringing in for reduction a large amount of ores that were previously thrown away, and enabling us to run the mill more regularly. Of these ores there was worked during the year 667 tons, assaying $61.61 per ton, and yielding in bullion $39,050.63.

The custom ores are, as the name implies, ores purchased from outside districts, and from mines in this vicinity in which the company has no interest. They amount for the year to 471 tons, assaying $270.60 per ton, and giving a bullion value of $120,600.29.

Low Grade Ores.

A tour among the chloride delvers in Calico District cannot but impress one with the enormous waste of mineral now being committed. Every where in the sorting, anything which the miner thinks will not work $40 per ton or over is thrown upon the pile. He tells you that it does not pay him to ship ores of lesser grade, that the cost of shipping and milling eats up the product. Again there are immense ore deposits in the district in which no higher grade ores have been found, and are therefore left to bide a change in affairs. But the actual waste going on is so serious as to demand the immediate attention of mill men and capitalists. In its arrest there are sure fortunes to be made.

In Colorado, the Black hills and elsewhere are worked mines and ores which average much less that $20 per ton with profit to both miners and mill.

Some years ago it was established in a suit in Silver City, N. M., that the cost of milling the chloride ores of that district was less that $10 per ton under a guaranty of 90 per cent yield of the assay value. The cost of fuel and labor then and there was quite as great as it is here now. Since that time the improvements made by science and experience are such as to greatly reduce the cost of milling ores of every kind. To-day the Oriental mill is reducing the low grade ores of the King mine, together with the high grade at profit.

It is capable of demonstration that a complete mill with all the modern appliances, economically handled, can reduce at least the free milling ores of this region, at a cost much less than $10 per ton, and can make large interest on the capital required to be invested, while at the same time leaving the miners enough to pay them high wages.

In this connection it should be considered that here as everywhere else, the number of mines that yield any considerable quantity of very high grade ores is small compared with those which yield large quantities of low grade. In fact it is noticeable in every silver district in the United States that most of the "rich strikes" made on the surface and published in the papers are soon "lost to sight," and become generally "to memory dear" either to the finders or too credulous purchasers. There is not one such find in 500 as the King Mine of Arizona, which carries pure metal to great depth. Capitalists have therefore become chary of interesting in claims showing merely a rich surface streak from which the miner plucks a specimen and carries it in his pocket for exhibition with the vain endeavor of "placing" his claim until the pockets of his last overalls are worn out. There must he somethiug more in sight to lure investment.

We insist, that what Calico District wants more than anything else is cheap milling and cheap transportation, and saving of the countless tons in sight of low grade ores running from $20 to $50 per ton. "There's millions in it."—*Calico Print.*

MECHANICAL PROGRESS.

Scraping Surfaces to Fit.

There is no planer that planes planes. The best it can do is make a series of minute corrugations nearly parallel and nearly level. When a job of iron work comes from a planer, its planed surface is a series of longitudinal ridges traversed by cross chatter marks. Except in degree this description applies to all work done on the planer, whether the tool used was a roughing tool with rank feed or a finish tool with fine feed. Two planed pieces of cast iron laid face to face would present surfaces of contact very much like the plowed fields of clay soil, except in a less degree.

The first preparatory work to the scraping of surfaces to fit is testing with the straight-edge, both longitudinally and across, to determine if the surface is out of wind. Inequalities are coarsely reduced by a float or mill file and afterward with a finish file, the straight-edge being the guide. The finish file must be used with great care, for it is not its office to remove all the marks of the coarser file, or even to obliterate those of the planer tool; for both may present surfaces looser in texture than untouched portions, and thus be too quickly and unevenly cut away. All this preparatory work is to be done under the guidance of the straight-edge—the surface plate has no part in it; the straight-edge determines the lines of level, the truth of the surface, while the surface plate shows the quality of the surface.

A wash of spirits of turpentine put on with a rag is better than red lead to show surface. Soon as this is put on, place the surface plate on the surface of the filed work, and rub it back and forth. This will show the condition of the surface, which will be in blotches and dots. All these bright blotches and dots should be scraped down, the finer dots and lines less proportionally than the broader blotches, and another trial with turpentine and surface plate made, to be followed again by judicious scraping. It is not expected that working surfaces are to be as perfect as those of the test straight-edges and the surface plates; the surface of the work should be even, without elevations or depressions, and should test to a straight line in all directions.

Scraping to fit is a slow, patience-demanding job, but it does not require the absolute exactness of the testing tools. Some of the tests for these are remarkable. When two surface plates, thoroughly clean, are laid together, one may be moved over the other at a mere touch, as though there was a film of ice between; the reason is that there is really a film of air between the surfaces, and it requires some force and movement to displace this air layer, when the plates will adhere so that one may be lifted by raising the other. Let one straight-edge be laid on another, face to face, and then move one end of the upper one transversely back and forth as though it was mounted on a pivot. After a few attempts a pivot will be found at a point about two-thirds or three-fourths of the entire length of the straight-edge from the moving hand. But if these surfaces are left in contact for awhile, they require force to separate them. A test was made of balancing a straight-edge three feet long and weighing thirteen pounds on a human hair. It was placed on another straight-edge, and the hair introduced between the two faces near the center. The upper one was moved on the hair as a roller until the proper point was reached, when it remained balanced perfectly, so that light could be plainly seen the entire length of the straight-edge between the two surfaces, except where the hair separated them at the middle of their length.—*Scientific American.*

Telegraph Wire.

Many experiments have been made, and no little money expended, in the endeavor to find the most economical and serviceable wire for telegraph purposes. Copper, iron and steel have been tried with varied success. Wires of compound and combined metals have been tried. The conditions sought after are the greatest conductivity with the greatest tensile strength and resistance to operation. Cheapness is also a very important consideration. Some very important experiments have recently been made in Europe with a new composition, known as silicious bronze, to which allusion is made below:

Quite recently, according to *Engineering*, at the request of the Eastern of France Railway Company, M. Lazare Weiller has developed a new type of telegraph wire, possessing less conductivity than the former, but having considerably higher tensile strength, which allows the wire to be more tightly strained, while the posts may be placed at greater distances apart. This new wire has a conductivity of 80 per cent and a tensile strength varying from 34.09 to 36.82 tons per square inch. The physical characteristics of this wire are not given. The same party has also been experimenting with a silicious bronze wire, made more especially for telephone service, and for which tensile strength is not of so much importance. After many modifications of this wire he produced a quality which gave a conductivity of 42 per cent, and tensile strength of 52.06 tons per square inch. He now also manufactures a special type for wide spans, with a conductivity of 21 per cent, and a tensile of 69.84 to 85.70 tons per square inch. The extended use of silicious bronze for telegraph and telephone systems affords further experience as to its behavior in practice, especially as to the manner in which it resists the effects of wind and snow. The Consolidated Telephone Company have several systems, in all of which silicious bronze is wholly used, one of which has especially been subjected to the test of wind during the frequent and violent storms, which usually levy tribute in the shape of uprooted posts and broken wires. In one case this wire, with a span of over 1,000 feet, withstood a most violent storm, blowing directly across it. Its power of melting snow has also been proven to be very superior. In Vienna, telephone posts are frequently placed at 1,000 feet distance apart, and carry as many as 78 parallel wires. These wires are of silicious bronze. These important advantages explain clearly the reason of the rapid extension in the use of silicious bronze as conductors for telegraph and telephone systems in Europe.

PROGRESS IN SHIP BUILDING.—When the ship Britannia was built, 45 years ago, it was looked upon as a marvel of size and power. It measured 1,155 tons, was 207 feet long, and 850-horse power engines, carried 220 tons of cargo, 120 passengers, and ran 8½ knots an hour. The new Cunarder, the Etruria, measures 8,000 tons, is of great length, has 14,000 horse power engines, carries 5,000 tons of cargo, and 1,500 passengers, and runs 19 knots an hour. The writer well recollects, when about 55 years ago, a 1,000 ton ship was built in Maine for a cotton carrier, and sent in ballast to Charleston, S. C., for a cargo; her arrival there was considered a most remarkable event. While there she was visited by thousands of people, and was looked upon as a wonderful achievement of ship-building enterprise. The famous Liverpool packets, which 50 years ago supplied all the facilities for passenger traffic between New York and Liverpool, were generally from 350 to 450 tons measurement, and were then the finest specimens of mercantile naval architecture afloat.

THE BLAST PRESSURE IN THE BESSEMER STEEL PROCESS.—In converting the steel by the Bessemer steel process, the pressure of blast used, generally runs from fourteen to twenty pounds per square inch. Few works have engines of capacity and power sufficient to maintain a pressure of over twenty-five pounds while blowing a heat. On January 23d, however, while blowing a heat in their converting works, the Scranton Steel Company maintained with their engines a continuous blast pressure of fifty pounds to the square inch. On Thursday last, they went a step further and performed the feat of blowing a heat in each of their two converters at the same time. The heat weighed four and one-half tons each, and were blown in twelve minutes. So far as known both of these feats are without precedent at any Bessemer works elsewhere, and their performance shows the very unusual power of the company's engines.

IRON MASTS.—The general impression is that an iron mast is much heavier than one of wood of the same dimensions. In reality, however, it is lighter than wood. A 60-foot trunk of spruce or yellow pine 2 feet in diameter at the base weighs far more than the shell forming the modern iron steamship masts. The masts for the new American cruiser *Atlanta*, for instance, will be fine specimens of their kind. The mainmast is 2 feet in diameter at the base, tapering to 17 inches at the top, at which point the funnel will be fashioned square; its length being 68 feet 4½ inches, the foremast being two inches shorter. The method of construction is peculiar. Three T-shaped rods of steel the length of the mast to be made are affixed base outward in circular wooden frames, and around the skeleton thus formed, the ready shaped plates are riveted in place. The plates are 12 feet in length, and about ⅜ inch in thickness.

A PREDICTION.—Mr. Edison has achieved so many triumphs as an electrician, that the public will be disposed to believe him when he says: Electricity as a motive power will not be confined to household or factory purposes. It has already been successfully used (for experimental purposes) at Berlin, Paris, Portrush (Ireland), and by the writer at Menlo Park as a motive power on a railroad. These various experiments have proven the practicability of the electric locomotive, and indicate that it will be largely adopted in the future in place of the steam locomotive.

SEVERAL SMALL VS. A SINGLE LARGE ENGINE.—It is said to be quite common in many localities, for large manufacturing establishments to substitute several small engines, each running one belt for a single large engine. Where every belt is running, the single large engine is economical; but as the number of belts is reduced, the proportional cost of the large engine rapidly increases. Besides this, if the main engine gives out, the whole establishment is brought to a standstill, while with the small engines only the shaft connected with the particular one is affected. The saving, year by year, from this plan, is said to be very large.

HYDROGEN IN IRON AND STEEL.—Brustlein concludes, from a great number of observations, that iron and steel can be alloyed with nascent hydrogen at ordinary temperatures; that at a red heat this alloy is broken up, but that at the melting temperature of steel, it may again be alloyed with hydrogen with more or less energy.

SCIENTIFIC PROGRESS.

Liquefying Air.

Science has been able to liquefy even the lightest and most mobile of gases. One of the latest accomplishments in this direction is the liquefying of atmospheric air—reducing it to a condition in which it can both be seen and felt as a liquid. This result was first accomplished at Paris in December, 1877, by Messrs. Pictet and Cailletet, two French scientists. Since that time the experiment has been many times repeated and in various places.

The pressure and degree of cold required for this interesting experiment are both very great. The exact figures are not before us, but they are much in excess of that required for liquefying carbonic acid gas, which is 5,000 pounds to the square inch and 200 degrees of temperature below the zero of the centigrade thermometer.

There is no difficulty with implements of the proper strength to reach the pressure required, but to obtain the necessarily low temperature considerable skill and thought was necessary. The method employed is described as follows: The air to be operated upon is confined in a strong tube and placed under the required pressure, and that tube in turn must be contained within another to be filled with liquefied carbonic acid gas. These conditions being obtained, the liquefied carbonic acid gas in the enclosing tube is allowed to gradually escape, which in so doing absorbs a large amount of heat from the tube charged with atmospheric air, by which the temperature of the latter is reduced to 140° below zero. But even this is not sufficient, and the remaining work is accomplished by allowing a certain portion of the air already compressed to the desired degree to also escape. This, by a further absorption of heat, lowers the temperature sufficiently to liquify a portion of the remaining air before the pressure becomes too much lessened by that escaping. Thus it is that the property which gases in the liquid state or when highly compressed, possesses of absorbing great quantities of heat when the pressure is removed from them, makes possible the liquefaction of even the most refractory, and the artificial production of temperatures which are calculated to make the polar regions blush at their warmth.

The San Diego Society of Natural History.

This society, says the San Diego *Union*, has had a prosperous and useful existence of more than ten years. It has published many interesting and some valuable papers. Its meetings have been well attended. It has fostered and encouraged a scientific spirit among our people, even outside of its membership, and has succeeded in creating for itself a respectable place among the scientific societies of the country. To-day the society is out of debt and owns a library and museum, and a building adequate to its present needs.

The San Diego Historical Society a few days ago decided to unite with the San Diego Society of Natural History, and it is probable that the consolidation will be speedily consummated. This action will widen the influence and increase the usefulness of the society.

Mr. C. R. Orcutt, a member of this society, is publishing the *West American Scientist*, the only periodical of its kind on this coast, and though only two numbers have appeared, he has already met with encouraging success.

The society needs land, and will soon need a larger building for its growing library and museum. To meet these wants a building fund has been created and a committee of five has been appointed to raise funds for the purpose.

WHAT FOSSILS TEACH.—In a recent lecture Dr. P. H. Carpenter, of Eton College, mentioned the case of Greenland as an illustration of the manner in which the earth's history is read from fossils, those remains of by-gone life which in the middle ages were regarded as "sports of nature." Fossils of four climates, all warmer than the present icy one, are found in that country. Remains of the oak and the maple tell us that the climate was once very similar to that of England to-day, and the coal, found lower down, shows that something approaching tropical heat prevailed at an earlier period. The fossils of certain sea creatures appear on the land, and that Greenland once lay beneath the sea and that its water was temperate, while the coral, obtained still lower down must have grown when the waters were still warmer.

DRY ROT.—A study of the dry rot in the twigs of fruit trees has disclosed the fact that it is caused by a contagious and transmissible disease, in which, as in the dry necrosis of leprosy in man, the cells of the affected tissues suffer a degeneration into minute bacteria, whose germs are afterward disseminated by the rupture of the cell membrane. One diseased tree is capable of infecting a whole nursery. The old and young are alike liable to the ravages of the parasitic organism.

LUMINOUS PAINT AND EARTHQUAKES.—In the Philippine Islands, where earthquakes are frequent, small [illegible]allic plates, coated with luminous paint, are placed about the premises that at the first warning the inmates are quickly guided to the door, and thus to the street. In Manilla it is laid on in patches about the bedrooms and staircases, serving as guides for the door-handles and the stairs, night lights being especially dangerous. It is satisfactory to know that highly favorable testimony as to the practical value of this simple and inexpensive aid to safety has been and continues to be received from the places above named. The few critical seconds that by its aid may be most fully utilized are of the utmost importance.

DISEASE GERMS.—It requires a first-class microscope with the best accessories to find bacteria—and some dissecting scientists claim, a first-class imagination also. Bacteria are alleged to be germs of disease, and he who discovered them has been called as one of the greatest benefactors of mankind of this generation. A Philadelphia doctor now claims that he has invented a trap in which he can capture these infinitesimal germs as flies are caught in a fly-trap. This curious contrivance is the invention of Dr. W. H. Webb, of North Sixteenth street, who has upon many occasions in the dead hours of the night tested it in the streets, and has captured enough of these deadly germs to show that we breathe anything but a healthy atmosphere. He recently obtained permission from the mayor to set his trap in the gallery of a crowded hall, and the result was appalling. He declines to explain the details of his invention in advance of the publication of an article upon the subject, which he is writing for a medical journal. As soon as this appears he purposes to send specimen traps to prominent European and American scientists, so that the value of his discovery may be fully tested.

THE BIRTHPLACE OF THE MONSOON. In the plains of India at the commencement of the monsoon, storms occur in which the lightning runs like snakes all over the sky at the rate of three or four flashes in a second, and the thunder roars without a break for frequently one or two hours at a time. Yet it is very rare that any tree or animal is struck by the electric current. The explanation of this is the great depth of the stratum of heated air next the ground, which keeps the clouds at such a hight that most of the flashes pass from cloud to cloud, and very few reach the earth.

VISIBLE SPEECH.—A remarkable example of the facility with which deaf mutes may read the motions of the lips was given in public by a young lady of 17 who was entirely deaf. Her teacher stood between the gaslight and the wall, thus outlining his profile distinctly. His pupil stood behind him and read from the shadow on the wall the words that he uttered. Here we have a new illustration of the effect of special training—minute differences of form and expression of the mouth being instantly detected where the ordinary observer sees no definite change.

THE BED OF THE SEA.—Some of the researches lately made by English explorers in regard to deep-sea beds have led to the belief that there are no rough ridges, abrupt chasms nor bare rock, and that the sea bottom at great depths is not affected by currents or streams—even by those of the magnitude of the Gulf Stream—its general appearance rather resembling that of the American prairies, and it is everywhere covered by a kind of mud.

INFLUENCE OF PETROLEUM CANS ON THE COMPASS.—It is now claimed that refined petroleum in tin cases exerts an influence on the compasses of a vessel equal to the same amount of iron or steel. The masters of the German ship *J. Weisselholm* and the schooner *Maggie Dalling* have made written reports confirming the above, and in the latter case the captain claims that his vessel went ashore through an error caused by cased petroleum.

TORPEDOES AND IRONCLADS.—A series of experiments has been conducted at Spezzia, Italy, to ascertain the effects of torpedoes on a keel vessel of the type of the ironclad *Italia*. Her steel plates were displaced and bent, and the water entered her compartments, but she maintained her position. The result is regarded as showing that the effect of torpedoes is overrated, and that they are insufficient for the defense of ports.

M. NIAUDET has recently been experimenting with some success on the reduction of chloride of sodium (common salt) into its components by means of the electric current. It is to be hoped that he has discovered an economical means of separating this body into its elements, as both chlorine and metallic sodium are of very great value in the arts.

GLACIERS IN SWEDEN.—By examination and measurement during the last two years, Dr. Svenonius has found the glaciers of Sweden to number about a hundred, with a combined area of only nine Swedish square miles (about 400 English square miles). The glacial area of the country had been previously estimated to be more than three times as great.

HUXLEY AND DARWIN.—Huxley's acceptance of Darwinism is given in these words: "I adopt the theory of Darwin under the reserve that proof should be given that physiological species can be produced by selective crossing."

MINING AND SCIENTIFIC PRESS.

A. T. DEWEY. W. B. EWER.

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SAN FRANCISCO:
Saturday Morning, Feb. 14, 1885.

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Passing Events.

The local topic of interest is the strike among iron workers in the San Francisco foundries. The shops are practically closed pending negotiation between the employers and the workmen. The subject is referred to at length in another column.

The telegraph reports that miners are on a strike in the Wood River country, and resist the replacing of $4 men with $3.50 men. The cut in wages has extended to the Sawtooth country, and most of the miners at Vienna quit work on the 1st instant, refusing to take less than $4 per day. The strikers have notified miners through the press not to go to Wood River in search of work.

There is also trouble among the miners in Tuscarora, Nevada, the owners of the Navajo-Independence, desiring to cut down wages $1 per day. The employes refused to submit to a reduction of $1 per day, but expressed a willingness to accede to a cut of 50 cents. A telegram to that effect was forwarded to the management in San Francisco, but they decided if the reduction could not be obtained to close down until it could. The mill has closed down.

The Legislature has made an appropriation of $10,000 to have California properly represented at the New Orleans Exposition.

The news from the war in the Soudan has attracted great public interest this week, the death of the famous General Gordon being greatly regretted.

Smelting Carbonate Ores.

They first began successfully to smelt carbonate ores of copper in Arizona about 1873, when Messrs. Lazinski, opened the Longfellow mine, at Clifton. The ores consisted of carbonate and oxides of copper, associated with peroxide of iron and manganese. They worked with a crude Mexican furnace, then reverberatory and then put up a water-jacket furnace. It is estimated that they produced 20,000,000 pounds of copper, while they owned the mines, and this, when their nearest railroad was 700 miles distant, and coke had to be brought 80 miles. The Arizona Copper Co., a Scotch organization, now own these mines, and have an extensive plant, capable of turning out 30,000 pounds of copper a day. There are five furnaces, of the water-jacket pattern. When they were smelting in the copper, water-jacketed furnace, ore from the Longfellow, which contained rather an excess of base oxides of iron and manganese, it was found that when the charge contained an excess of manganese over iron, the slag was thick and the copper separated imperfectly; but the ferruginous slags usually made with about 50 per cent of protoxide of iron, and 10 per cent of manganese, did not contain over one per cent of copper. The ores carrying on an average only about 14 per cent silica, and the slags less than 30 per cent silica, the resulting coke copper was impure, nearly 10 per cent of iron entering it. These analyses are from the report of A. W. Wendt.

At another smelting works on the San Francisco river, the opposite error was for a time committed of running with a far too acid charge, the resulting slag from which was carried as high as 53 per cent of silica. As a consequence all the iron manganese and other valuable bases entered the slags, leaving the copper cake almost absolutely pure; but the silica had in addition to draw upon the copper, of which three per cent and over entered the slags. When charcoal was used by the Longfellow smelters the consumption was one to four and a half of ore. With three quarters coke and one-quarter charcoal the consumption of fuel dropped from one to seven. With coke, the Detroit Company is smelting over nine of charge with one of Welsh, or patent coke. These figures were compiled by Mr. James Douglas, Jr.

At the Copper Queen smelting works, at Bisbee, the production of a very pure copper cake and at the same time a tolerably clean slag has been obtained by a judicious furnace mixture. The furnace is supplied from a large body of oxidized ore in limestone. At the surface the ore consisted of crystalline masses of carbonate of copper and calcite, in which concretions of copper carbonate, calcite, oxide of iron and manganese were imbedded. As depth has been attained, crystalline carbonates have ceased to be the principal product, but they still occur in a soft argillaceous ore carrying a high percentage of copper as a carbonate and oxide. This constitutes the bulk of the deposit, and carries nearly enough silica to satisfy the lime, iron and manganese of the ore itself, which is thus almost self-fluxing when mixed in proper proportions.

The furnaces are of the well-known water jacket pattern. The furnace is fed alternately with Trinidad coke and ore, the coke being to the ore as one to six. When Cardiff coke is used its consumption is only one to seven and a half of ore. Throughout the mine traces of sulphur exist, which enter the cake, but no copper sulphide is found, nor is the lime a sulphate, as might be expected were the ore derived from a sulphide oxidized in place. The coke runs from 975 to 98 per cent. In 1882 the mine yielded 4202 tons of cake copper, equal to 4052 tons of refined ingot. In 1883, the yield was 7,950,000 pounds of copper. The statistics of this mine from the commencement of work up to March, 1884, show the following figures: Ore mined, 90,021 tons; ore milled, 89,586 tons; black cop per bullion produced, 12,050 tons; total value of product, $3,368,878; total expenses, $1,384,974; dividends, $1,225,000; average yield of ore in black copper bullion, 13 45-100 per cent; average yield of bullion when refined, 90½ per cent. They use about 6,500 tons of coke per year, 3,600 cords of wood, and employ about 180 men.

SOME prospectors claim to have discovered a tin mine in Douglas county, Or.

The Iron Workers' Strike.

For some months past business has been very dull among the foundry and machine shops in this city, and the larger foundries especially have felt the depression. Competition with Eastern-made machinery has reduced the volume of business and lowered prices, and the general prevailing dullness of trade has contributed to the depression. The proprietors of the larger shops posted placards informing the men that a reduction of 15 per cent would be made in wages, beginning on Monday last. The machinists, boiler-makers, moulders, etc., refused to accept the reduction and left the shops. The shops so far affected are the Union, Fulton, Risdon, National, Pacific and Empire. The committee of three appointed by the Moulders' Union visited the shops where the reduction notice had been posted, and informed the proprietors that the men would not go to work unless they received the old wages. Nearly all of the proprietors explained to the committee the cause of the cut, and in almost every case stated that they decided upon it reluctantly. The committee, on the other hand, stated that the reduction had been made without conference with the men, and that they had but one course to adopt, and that was to strike. Irving M. Scott suggested to the committee that the men appoint a committee of conference to meet the proprietors to adjust the matter.

Meetings have been held by the machinists, iron moulders, boiler-makers, pattern-makers and blacksmiths, to discuss the situation. They have agreed to stand by each other and hold out for the old prices. At the machinists' meeting resolutions condemning and protesting against the proposed 15 per cent reduction in wages were read and approved, and an invitation extended to all machinists and iron workers to sign the roll of the permanent organization. A rule was adopted requiring all who signed to deposit $1 as an initiation fee, the monthly dues to be 25 cents. The roll of shops was then called, the members of the various establishments coming forward and signing their names. A large number of unattached machinists also signed.

The proprietors of the Pacific Iron Works sent out an invitation to the various representatives to meet on Wednesday and discuss the matter of controversy. The meeting was held at Mr. Rankin's office at 3:30 o'clock, and lasted nearly two hours. The moulders were represented by their committee, composed of Samuel McKee, Charles Hawkins, James de Succa, H. R. Luke and Felix Gunn. The employers were represented by Ira P. Rankin and A. P. Brayton of the Pacific Iron Works, J. O. B. Gunn of the Union Iron Works, Richard Savage of the Empire, Daniel E. Hayes of the Fulton, and W. H. Taylor and Joseph Moore of the Risdon. The proceedings assumed the form of an informal conversation, no offer of compromise being made or hinted at on either side. The conversation was pleasant and entirely without acrimony.

On the part of the employers it was stated that the proposed reduction was justified by their inability compete with Eastern manufacturers at the present rates of wages. The manufacturers had found it impossible to compete with the Eastern houses for the trade of Arizona, New Mexico, Mexico, Montana and Idaho. They were frequently invited to estimate on work for those Territories, which they considered neutral ground, but, owing to the high rate of wages prevailing here, they were unable to do so, and to-day San Francisco did not get more than 10 per cent of that trade, although there was no longer any unjust discrimination in freight rates to those points in favor of Chicago and St. Louis as against San Francisco. They claimed that they had been losing money, and that the reduction was a necessity.

On the part of the men it was admitted that if these statements were true there would be no injustice in the action of the proprietors, but they did not admit that the statements made by the employers were borne out by figures. After about two hours spent in fruitless discussion, the conference adjourned without any action. It is reported that the large iron works which had time contracts on hand, under which they were liable to penalties for non-completion of the work within contract time, have secured extensions of time in anticipation of the possibility of a long suspension.

The proprietors of the shops insist upon the 15 per cent reduction in the wages of all the pattern-makers, moulders, machinists, blacksmiths and boiler-makers in their employ. The journeymen accordingly, to the number of about 1,000 or 1,500, are all out on a strike and the shops are comparatively vacant, containing only a few apprentices and the foremen. For a time it was believed that a compromise could be effected by the employers limiting the reduction to 10 instead of 15 per cent, but these terms are not acceptable to a majority of the men, who declare that they will resist to the last any attempt of the "bosses" to lower wages. The Iron Moulders' Union is a branch of the National Iron Moulders' Union of Cincinnati, that claims a membership of from 15,000 to 20,000. The status of the strike has been telegraphed to the National Union, and the men are sanguine of receiving substantial pecuniary aid from their brethren in the East should the struggle between the employes and the employers be continued for any considerable length of time. The proprietors, on the other hand, feel that as business is exceedingly dull, they can afford to close the shops for a time if necessary. Efforts are being made for a compromise, but at this writing no conclusion has been reached. A few boys are working at some of the shops, but most of them are closed down.

"Concentrates."

[Written for Press by "F. W. S."]

IF you want a mine, develop your prospect.

NEVER build a mill till you've got an ore producing mine.

STICK to one claim and develop it systematically.

SUBSCRIBE at once for your local paper. In addition to this take a journal that is devoted exclusively to mines and mining, as such a paper keeps you posted on mining laws, new and successful methods, and through its columns the attention of capital is attracted toward your camp and your mine.

IF a stranger visits your camp looking for investment, don't frighten capital away by asking a dozen prices for a good-looking prospect hole. Always remember a prospect is not a mine.

MINES are not found—they are made, by thoroughly developing a prospect.

THERE are too many men with more sand than sense superintending and working mines now-a-days. There are exceptions, of course. Some seek in Colorado that which only exists in California, and *vice versa*.

MEN thoroughly conversant with the formations and ores of a district are the best to superintend a mine.

ALWAYS arrange your selections of ledge and vein matter for assays; don't pick out the rich and leave the poor. Further investigation will reflect bad on yourself and the entire district.

DO not misrepresent a mine; it not only hurts yourself, but the camp as well.

ENCOURAGE and assist legitimate mining. Do not appoint a bank clerk or store-keeper as a superintendent of a mine or mill.

MINING SUPERINTENDENTS do much to help or kill a camp. A practical man in charge of a property should be encouraged.

TRY and post yourself on the formations of your district. Do not work on the "by guess and by gosh" system.

GO DOWN deep on a vein before starting a long tunnel to tap it. Be sure that the ore is of such grade and quantity as to justify you in taking chances on a long tunnel through hard rock.

TAKE a pick handle to all cranks who come around with "whang doodles," "indicators," and such spiritualistic rackets.

SIT down on all booms. If big strikes are made and paying mines opened, there will be no trouble to dispose of them all to men of wealth. Money will develop the camp and its inhabitants; not the rabble who follow a boom will reap the benefits.

Dakota Tin Mines.

For many years search has been made by prospectors to find paying mines of tin in the United States. A deposit of tin was found in San Bernardino county, in California, but for some reasons, though a little tin was produced, the mines have never been worked in a manner to put their product on the market. There has been a sort of mythical idea that the Government would give a reward for the discovery of tin mines, but our Government does not offer such aids to any industry. When a man finds a mine of any kind he can take possession of it, and for a nominal sum patent and get a Government title to the property.

Tin has finally been discovered, however, in Dakota, and in quantities that promise to make the mines there very valuable. Through the kindness of Mr. Mark R. Hydliff, of Bear Gulch, D. T., we have received a box of specimens of ore and a small block of the tin, which may be examined by the curious at our editorial rooms.

The little bar of tin is from Nigger Hill, where the mines are located. There is also a small bar of stream tin, similar to that found in Cornwall. There are also specimens of ore from the following claims: Swansea, Ohio, Crow Dog, Grace, Commercial, Rough and Ready, Boston, Grant, Michigan, Morning Star and Dakota. The samples are much alike, and are all distinguished by carrying considerable mica. Mr. Hydliff sends us a description of the mines, which is as follows:

The Bear Gulch section of country lies in the northwestern corner of the Black Hills, about eighteen miles west of Deadwood, D. T., and about ninety-five miles north of the south line of Dakota, and is composed of four mining districts—Iron Creek district, Potato Creek district, Rawlins district and Hurricane district, the latter being in Wyoming Territory and adjoining Rawlins district on the west, and separated by the Territorial line. This section of country from the time of the discovery of gold in the placers, for a few years was one of the best producers of gold in the Black Hills, but the mines, which had the advantage of plenty of water, were worked out, cutting the production down. But a new source of wealth is looming up in the tin, and tin mines of Nigger Hill and vicinity. In washing the gravel of the placers for gold, a very heavy, dark-colored mineral was encountered, which the miners called "iron-rock" or "black sand," but a little over a year ago was discovered to be stream tin ore, cassiterite or black oxide of tin, and carrying from 60 to 75 per cent of pure tin. There are about fifty miles of gulches in this section, which will produce an immense amount of stream tin ore when worked with a proper system for saving the ore. Until the spring of 1884, the stream tin was considered a nuisance, and cast away with the tailings, but when the season opened, the miners in working for gold, out of curiosity, saved what tin they could conveniently with the common sluices and riffles, and made so as to get rid of the tin as much as possible, and about four tons of the ore was collected and shipped, two tons going to England and the balance going to different points of the United States, all to be tested and experimented with; and all returns give a remarkably pure oxide of tin.

On the discovery of

Stream Tin in the Gulches,

Prospectors were induced to search for the source, and it was soon found in the immense granite ledges that are plainly traceable through the country. The ledges are true fissure veins, from two feet to three hundred feet in width, with slates and porphyry for wall rock. The granite is composed of very coarse crystals of quartz, feldspar and mica, and carries the tin ore in fine particles, invisible to the eye, disseminated through the rock, also in coarse cubes and crystals, and quite free from base minerals, and assaying as well, if not a little better, than the stream tin. The tin ledges also yield an average assay of about $8 per ton in gold and good trace of silver, and with proper reduction and concentrating works, the tin and precious metals can be readily saved, as the rock is free milling, and tin ore does not interfere with amalgamation. The area of the belt is about 6x8 miles, partly in Wyoming and surrounded by lime and sandstone. The prominent tin mines and those which show up the best for the small amount of development are those of the several groups situated on the divide between Bear and Sand creeks, of the Nigger Hill group situated on the summit of the divide.

The Rough and Ready is developed by an open cut, exposing the ledge for 50 feet across the vein, showing good tin ore and assaying eight dollars per ton in gold and good trace of silver.

The Mines.

The Giant has a tunnel 300 feet and shaft 60 feet, showing good veins of tin ore, and carries milling prospect in gold. Morning Star has a shaft down about 10 feet in a fine body of tin ore. The Michigan is developed by a tunnel 65 feet in ore, improving on depth, with porphyry hanging and footwall. The Ohio, the north extension of the Michigan, has a good body of ore with porphyry hanging and footwall. West of the Ohio is the Indiana, and east of the Ohio, the November, both promising locations. On the eastern slope of the divide, towards Bear Gulch, are the Modoc, with slate walls and fine tin croppings: Crow Dog, with shaft 35 feet deep, slate walls, and assaying two and a quarter per cent of tin ore, $7.60 in gold and $1.60 in silver per ton. The Sontag ledge is eight to nine feet in width, with slate walls and showing the same characteristics as the other locations.

Steptoe is looking well and has a slate footwall with porphyry hanging wall.

The Spearfish is developed with open cut and is a very wide ledge with porphyry hanging wall and slate footwall. It also carries good prospects of gold and silver.

The Mono and Soho are each developed by by two shafts and show tin in each of the shafts, the walls being slate. Between Mace and Wyoming gulches is the Swansea consisting of four locations. The Swansea No. 1 is opened by a shaft 12 feet deep, carries tin and gold, and has slate walls running into porphyry. Swansea No. 2 has two shafts 14 feet deep, trap rock hanging-wall, carries tin and gold—about five per cent of tin. Swansea No. 3 has a shaft 25 feet deep; vein three feet wide; slate walls, and carries gold and tin. Swansea No. 4 has a shaft 12 feet deep, with slate walls, and carries gold and tin. Northerly on the same vein is the Boston group, embracing five locations.

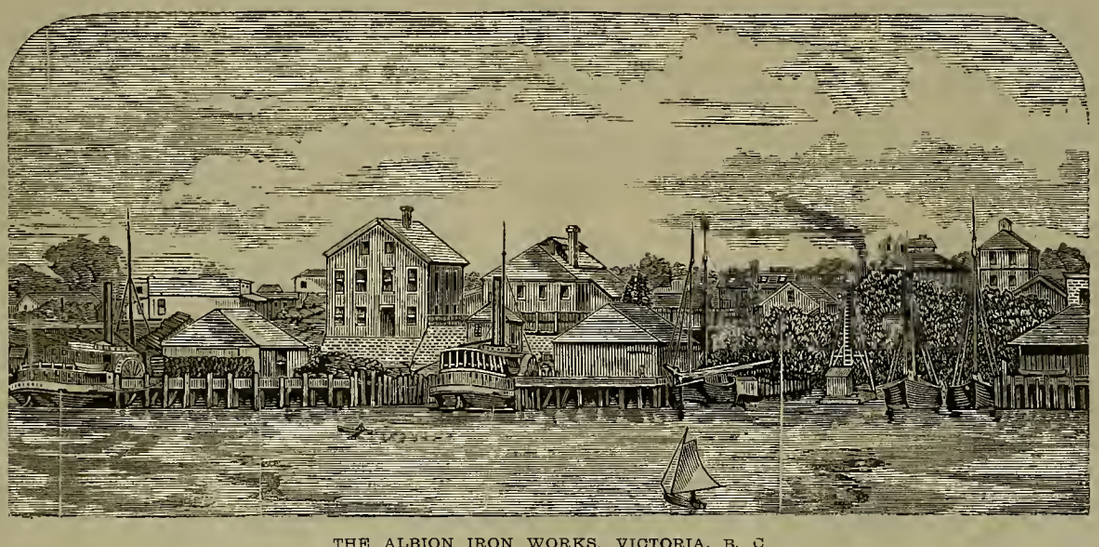
The Boston is opened by a shaft 25 feet, with slate walls and carrying a fair average of from four to five per cent of tin ore to the mass. The Commercial, another fine vein, also carrying from four to five per cent of ore has slate walls, and is opened by a shaft 25 feet. The New York, Atlantic and Pacific are three promising locations of the same group.

The Grace is a promising tin mine with a large body of tin ore, and good prospects of gold ore obtained by pulverizing and washing with the pan. There are also hundreds of other locations with but little or no work upon them, which might prove good properties should pains be taken to explore them. The locations mentioned are thought to be fine prospects by all experienced experts who have visited this section of country.

Northwest Coast Iron Works.

On this coast, notwithstanding our abundant mineral resources, in one respect we are somewhat lacking, and that is in the matter of iron. In California there is only one deposit of iron being worked. In Oregon and Washington, and in British Columbia some iron ore is being worked also, the Oswego works of Oregon shipping some pig iron to this port. Within the past two years, however, our northern neighbors have been looking up their iron interests, and in addition to opening a few mines, several iron working establishments are now at work. That of the Albion Iron Works at Victoria, B. C., is one of the oldest and best equipped on the coast north of this city.

These works occupy about three acres of space.



THE ALBION IRON WORKS, VICTORIA, B. C.

They front directly upon the harbor, and have extensive wharves and commodious store-houses. The machine shop is 250x50, two stories, and fitted with machinery of the most approved kind.

The company manufactures steam engines of every description, fish-canning machinery, etc., and can complete the largest work required. In the pattern room all the patterns required for the works are made. The brass finishing shop contains all necessary machinery. The blacksmith shop, boiler house and foundry are also completely supplied. In the stove foundry are turned out more than 30 different kinds of stoves, for kitchen, parlor, hall and other purposes. About 100 skilled mechanics are employed.

These works have supplied the iron for bridges on the North Pacific Railway west of the Rockies, and are now under contract to supply all the iron work necessary to complete or equip the British Columbian section of the Canada Pacific Railway. The works have recently completed two pair of powerful hoisting engines with drums 96 inches in diameter for the Wellington Colliery. The stove department has become quite an important part of the business, turning out 40 stoves per day.

FILTERING APPARATUS.—Trials are being made this week on the upper floor of 23 Stevenson street, of the filtering apparatus of Juan Macay. This appliance is intended for use in the solving process of working ores, by which the filtering may be hastened and better results attained. On the completion of the tests we shall publish the results together with a description of the machine. Persons interested in machinery of this character may see the apparatus at the address given.

California Mining Appliances for Russia

Mr. Michael Shostak, a mining engineer who was sent by the Russian Government to Australia and to this country to examine the methods of gold mining, has completed his investigation, and this week returned, by way of New York, to St. Petersburg to make his report. He spent several months both in Australia and in California. While here he visited the centers of the gold mining industry, examining the quartz mill machinery, and the appliances used in hydraulic, drift, cement and placer mining. In a conversation with him a few days since, he expressed himself as much pleased with what he saw here, and stated his determination of ordering from California a number of the mechanical appliances which he saw at work.

In some few things he thinks the Russians are ahead of us. He thinks their puddling machine for washing gold gravel is superior to anything we have where there is not enough water to hydraulic. He is of the opinion that it could be successfully applied in our drift mines. Mr. Shostak has promised to send us a detailed description with drawings of the best Russian puddlers, when he arrives home.

He was much pleased with the plant he saw at the Spring Valley gravel mine, and the mills in Nevada county. He was not very favorably impressed with our hydraulic mining system, on account of the percentage of loss, though he recognized, of course, what enormous quantities of material could be removed. But in his country the government enforces a rule that certain percentages must be saved or the mines are taken from those working them, after fines for the first offence. One appliance he saw here he says will be of great benefit to Russian gold miners, and that is the Cranston gravel elevator. He will order a number of these. The Pelton water-wheel he will also introduce. He says that in Russia they use elevators and endless belts for handling their gravel to great advantage, and saw several places here where they could be used beneficially and dispense with horses and men. In his report to the Russian Government, Mr. Shostak will describe in detail all the appliances he saw here, and he is convinced that many of them can be introduced in Russia to the benefit of their mines. He has ordered copies of the MINING AND SCIENTIFIC PRESS to be forwarded hereafter to the Mining Department of the Russian Government, in order that they may see what improvements are being made in the methods and appliances of gold mining.

ORE STEALING.—A dispatch from Dagget, San Bernardino county, dated the 11th, says: Owing to claim jumping and ore thieves, William Raymond and J. S. Doe, owners of the Garfield and Odessa group of mines, have closed down, throwing over 100 miners out of work. Thieves have been carrying off ore by the sack for 80 days, using the shot-gun to protect their thievish operations. The country is full of tramp miners. They are carrying a high hand on all sides. James L. Patterson, superintendent of the Garfield, has resigned and is about to leave the country, owing to the numerous threats to take his life. Sheriff LeCyr is keeping the shooters quiet, but they are liable to break out at any hour. The jumpers and ore thieves of the Nellie Gray are in jail in San Bernardino, being unable to give bonds.

THE DIVIDEND this month of the Plymouth Consolidated mine, Amador Co., Cal., is the twenty-first consecutive monthly dividend of $50,000, or $1,050,000 in all.

THE Massachusetts Legislature has refused to allow a woman preacher of Nantucket to perform the marriage ceremony.

The Nevada Silver Convention.

In last week's PRESS the resolutions adopted by the Denver Silver Convention were given, and mention was also made of the Nevada Silver Convention which met at Carson. The committee on credentials found the following entitled to seats in the convention:

Eureka County.—E. Robert (M. D. Foley, proxy); H. Johnson (M. D. Foley, proxy); R. K. Morrison (M. D. Foley, proxy); J. C. Powell (M. D. Foley, Proxy); R. Sadler, F. Rohhius, Alex. Fraser (D. E. Bailey, proxy); W. Arrington (D. E. Bailey, proxy); Henry Rieves, S. J. Beehee, George Mullins (W. J. Penrose, proxy).

Churchill.—Charles Kaiser, W. H. A. Pike, L. Alleu (W. Marsden, proxy); W. W. Williams (J. W. Furgerson, proxy); C. S. Kellogg (C. Kaiscr, proxy).

Ormsby.—D. A. Bender, Robert Logan, A. C. Ellis, T. D. Edwards, George H. Morrison, Evan Williams.

Esmeralda.—W. M. Seawell, J. M. Jones, A. B. Turner, T. H. Wells, A. Farriugton.

Nye.—N. S. Trowbridge, George Ernst, R. C. Langworthy, George E. Clark, Patrick Downey (A. Maute, proxy); T. J. Bell.

Washoc.—Jerry Schooling, R. L. Fulton, C. C. Powning, B. F. Leete, H. H. Beck, J. H. Whited, A. H. Barnes, W. N. Knox, C. S. Prehlc.

Storey.—C. C. Stevenson, R. P. Keating, J. M. Douglass, E. Strother, M. N. Stone, H. G. Shaw, William Woodburn, W. E. Sharon, Thomas Hulley and J. F. Egan.

Elko.—J. W. Powell, J. H. Dennis, W. J. Hanks, R. P. Hamill and P. Holm.

Lincoln.—J. F. Hallock, H. Rice, J. Poujade, E. F. Morton and C. F. Meyers.

White Pine.—E. N. Rohinson, Frank Drake (L. Liddle, proxy); J. R. Kendall, J. F. Cupid, J. B. Williamson (A. C. Stearns, proxy); Robert Briggs, A. C. Cleveland and Dr. L. B. Brooks.

Douglass.—A. C. Pratt, J. W. Haines, J. Rodeuhaugh, A. W. Pray and J. F. Williams.

Humboldt.—J. W. McMillan, G. M. McRoss, H. V. McCurdy, M. Colley and M. Mills.

Lyou.—George W. Kieth, C. C. Thomas, George W. Likens, N. C. Dovcy and H. Rulison.

Lander.—J. Marks, L. W. Getchell, J. R. Williamson, E. T. George and John Smyth.

Delegates at Large.—J. W. Adams, C. E. Laughtou, C. H. Belknap, O. R. Leonard, T. P. Hawley, W. H. Davenport, C. F. Bicknell, J. M. Dormer, J. F. Halleck, George Tufly, C. S. Yonug, H. G. Parker, J. C. Harlow, William Garrard, Robert Harper, Wells Drury, S. P. Davis, M. D. Noteware, Otto Greenhood and all members of the Senate and Assembly.

A number of gentlemen spoke concerning the silver question. Among them Col. H. G. Shaw, editor of the *Virginia Enterprise*, Hon. Wm. Woodburn. Senator Briggs, Mr. Ernst, Geo. Morrison, of Ormsby, Mr. Dovey, Chas. F. Becknell, Mr. Fulton, of Reno, Mr. Bell, of Nye and others. A committee was appointed to embody the views of the convention in writing and the committee reported the following resolutions:

WHEREAS, The agitation in financial circles against the continued coinage of silver in the United States has assumed so serious an aspect as to menace not only the silver mining industry of the country, but to depreciate the prices of all agricultural products, to greatly increase the burdens of the debtor class and to greatly lower the wages of every class of labor; therefore, we, the people of Nevada, in convention assembled at Carson City, January 31, 1885, do hereby declare as our deliberately-formed conviction, that the said agitation is based upon glittering fallacies, false premises, perverted figures and distorted facts. As evidence of the justice of our position, we submit the following self-evident propositions, to the truth of which we challenge successful contradiction:

First—That while the United States of America includes only four per cent of the population of the globe, it annually produces one-third of the gold and one-half of the silver product of the civilized world.

Second—That to paralyze the silver industry in the United States is to rob the world of one-ninth of its total gold product, that being the proportion of the world's gold crop harvested from American silver.

Third—That owing to the hostile legislation, both in Europe and the United States, against silver as a monetary metal, its natural function as a medium of exchange has been greatly though not irretrievably impaired, and its twin metal, gold, correspondingly inflated, thus diminishing the volume of the entire specie for the business of the world.

Fourth—That Great Britain, while sustaining the single gold standard at home, is one of the principal silver-using nations of the world, and is interested in depreciating the bullion value thereof in order to facilitate her vast commerce with her Indian possessions. With cheap silver in the London market she is enabled to buy wheat in Calcutta at a lower rate than she can import breadstuffs from the United States. With the American government co-operating in the pernicious work of depreciating silver, our surplus bullion seeks the London market and becomes, in the hands of foreign capitalists, a weapon to annihilate American agriculture. Thus are our own products turned upon us to degrade and cheapen American labor.

Fifth—The annual addition to the stock of silver and gold in existence is proportionally smaller than the annual increase of population, wealth and exchange.

Sixth—The ratio of the production of silver to the production of gold continues practically unchanged; therefore, be it

Resolved, That this Convention heartily indorses the resolutions of the late Silver Convention held at Denver, Col., and is as follows:

The States and Territories of Kansas, Colorado, Utah, New Mexico, Idaho, Wyoming and Arizona, in Convention assembled, adopt the following resolutions as a declaration of principles:

First—That we are in favor of the doctrine of bimetalism as embodied in the laws of the United States previous to 1873, and we urge the enactment of those laws at the earliest possible moment.

Second—That, in the interest of trade and commerce, we demand free and unlimited coinage of gold and silver bullion at the present standard of coinage.

Third—We demand that Congress shall pass an Act directing the Secretary of the Treasury to withdraw from circulation all one and two dollar bills, in order to give a larger circulation to standard dollars.

Fourth—We condemn the Secretaries of the Treasury for their unlawful evasions of the provisions of the Bland bill, and demand that clearing-house balances and obligations of the Government be paid without discrimination in gold and silver, or gold and silver certificates.

Fifth—Resolved, That it is the sense of this convention that a law amendatory of the National Bank Act be enacted whereby said banks throughout the United States shall keep not less than fifteen per cent of legal reserves in national silver coin, and also that the redemption fund of said banks shall be in silver coin.

Sixth—That until Congress shall restore silver to its ancient, rightful and constitutional equality with gold in respect to coinage, we demand a liberal construction and faithful execution of the provisions of the Bland bill.

Seventh—That the demands and recommendations about to be made are based on broader grounds than any consideration of mere sectionalism or protection of a particular industry; that they are the well-nigh forgotten terms of the wise Constitution and laws under which this nation has gained its place as the foremost people of the globe; that silver needed no such protection as is extended to the pampered industries of the East; that this question is touching the interests of every human being in this broad land, and that it involves the question of whether the debt-paying medium of the nation shall be so changed as to increase the value of notes, bonds, mortgages and other fixed incomes, and depreciate the value of all other property, and also involve the proper execution of our Constitution and our laws.

H. C. Snyder, of Kansas, offered the following, which was adopted:

WHEREAS, The material and commercial interests of the southern and western portions of this nation are of great importance to the prosperity of the whole nation; and,

WHEREAS, The Secretary of the Treasury sways the financial power of the Administration, and has seemed to possess the power to almost nullify Acts of Congress, as is notably instanced in the manner in which the Treasury has been administered since the passage of the Act known as the Bland Silver bill; therefore,

Resolved, That the Silver Convention, composed of delegates from the several States and Territories, of all political opinions and complexions, earnestly request President-elect Grover Cleveland to select some statesman for Secretary of the Treasury who will not labor in the interest of national banks and Eastern brokers, but will recognize the great interests of the South and West in shaping the financial policy of the Administration and strive to promote the interests of the whole people, instead of consulting the wishes of the magnates of Wall street.

Resolved, That the suggestions of the Secretary of the Treasury in his late annual report to the President, that the accumulation of standard dollars in the vaults of the Treasury of the United States has resulted in great inconvenience to that Department, and that because of such fact the further coinage of silver should cease, are not worthy to be considered in connection with the prosperity of the people engaged in the production of silver, nor in connection with the proper solution of the question of the currency of the Republic; but to meet such alleged inconvenience and to promote and maintain the prosperity of the thousands who have embarked their all in the production of the precious metals in our country, upon the faith of past legislation, this convention declares that it is in favor of the enactment of such laws as will authorize and require the issuance of silver certificates for all domestic silver bullion of the required fineness, which may be deposited at the United States Mints after the same shall have been parted and refined and the value thereof stamped by the Government upon such bullion, such value to be expressed in standard dollars of the weight of 412½ grains, as now required by law, and such bullion value to be estimated and determined at the ratio of $129.29 per ounce of fine silver. Such bullion to be kept by the Government on deposit for the redemption of such silver certificates, which shall be a legal tender for all debts, public and private. That it is to the interest of trade, commerce and the permanent credit of the United States that the paper currency of this nation should be represented by its equivalent in gold and silver in the United States Treasury at a date as early as practicable.

Resolved, That we believe that the recoinage of the subsidiary silver coin, so that it shall carry the same proportion of silver as is contained in the standard dollar, would result in the purification of our silver coinage and in the advantageous use of much of our unemployed silver.

After recording the foregoing resolutions, each one of which elicited loud applause, Colonel Ellis delivered a graceful and eloquent address, during which he recited with much vividness the various aspects of the war against silver.

A motion by Lieutenant Governor Laughton was carried, urging the immediate organization of a permanent association and the reference to it of other matters of the work of preparing a memorial to be submitted to Congress.

The Committee on Resolutions reported without recommendation two resolutions offered by Mr. McMillan, of Humboldt. One was urging the Legislature to re-establish the office of State Mineralogist, who shall be a graduate of some reputable school of mines or metallurgical college; also recommending that a mineral reduction works be established in connection with the University for the accurate and successful treatment of ores in quautities of one ton and upwards, which reduction works shall be under the management of the State Mineralogist, who shall hold his office four years, and that in connection with said reduction works a mining bureau be established for the dissemination of data connected with the reduction of silver. The second resolution was as follows:

That our representatives in Congress be requested to use their influence to have created a committee to revise the existing mining laws of the United States, and, if possible, so revise these laws that hereafter a person's title to a mining claim of any kind shall consist in actually using and in the continuous working of said claim, that when said work has not been done for a period of sixty days such claim shall be considered abandoned.

Both these resolutions were referred to the permanent organization.

Mr. Dennis offered the following resolution, which, after considerable debate, was referred to the permanent organization:

Resolved, That this convention favors such modification of the bullion tax law in this State as will reduce the tax burden uniformly and equitably upon all classes of ores, thereby affording equal relief to the mining industry in all parts of the State.

Bodie's Yield.

Statistics Covering a Period of Eight Years.

The Bodie *Free Press* gave a brief report of the bullion shipment as shown by Wells, Fargo and Co.'s books, but owing to portions of shipments that were recorded in previous tables on the last of December and in the express books on the 1st of the new year, the output for the past year does not foot up quite so heavy. The grand total, however, is the same. The *Free Press* says: We take pleasure in again presenting a showing that will be a surprise to many who predicted that the bottom had been knocked out of the district. It is our candid opinion that new developments will bring the camp to the front for eight years more of prosperity; that in the past season we have experienced the worst. Even should all else fail, we have a low-grade proposition that must eventually make bright the many homes of those who are not here merely for their health.

Standard Consolidated.

On the 19th of last March 15 stamps that were employed on Standard ore at the Bulwer-Standard mill closed down, and on the 2d of May the "Old Reliable," the Standard mill, was silenced for the first time since its erection. About the 5th, 15 stamps were again employed at the first named mill and the remaining 15 stamps were run on Bodie Consolidated ore. The 30 stamps continued crushing ore from the two mines till about the 10th of July; then the Standard Consolidated ran the entire mill, using one-half (15 stamps) for working tailings until December 5th. Owing to the frost, the working of tailings was discontinued, but 15 stamps continued crushing ore until about December 15th, after which the mill was closed down. On the 16th of the new year, present month, it resumed again, working 15 stamps on ore. The pumping machinery of this mine was stopped when further prospecting on the lower levels ceased, consequently at the present time there is about 300 feet of water, from the 900 to the 1200-foot levels. Although it has proved a dull season for the Standard and brought about the first assessment, yet it is folly to presume that the bottom is knocked out. Its record of disbursing four and one-half millions of dollars among its shareholders ought to be a sufficient guarantee that the mine will be kept in order and further developments prosecuted as long as the present low-grade ore (of which there is a large quantity) continues to pay the hulk of the expenses. Should cheaper facilities for milling be in any way devised, there cannot be any doubt but that the mine will continue work for as many more years, with the chance of striking new developments at any time. Worked as cheap as the Syndicate, the low-grade ore now in sight would probably more than pay expenses.

OUTPUT OF STANDARD CON. MINE IN 1884.

	Gold.	Silver.	Total.
Jan	$49,142.73	$6,684.98	$55,827.72
Feb	31,136.22	4,312.30	35,448.52
March	21,249.60	3,052.71	24,302.31
April	6,260.21	1,083.65	7,343.86
May	.....	.....	.....
June	24,183.71	2,467.65	26,651.36
July	22,973.39	3,050.23	26,023.62
August	25,520.05	4,132.73	29,653.38
Sept	25,788.89	3,500.83	29,298.72
October	23,950.27	3,593.05	27,543.32
Nov	18,157.81	2,555.08	20,712.89
Dec	19,413 68	2,084.39	21,498.07
Total	$267,777.16	$36,517.60	$304,294.76

TOTAL OUTPUT OF THE STANDARD CON. TO DECEMBER, 31, 1884.

1877	$784,522.80
1878	1,025,383.35
1879	1,148,845.47
1880	1,858,763.46
1881	2,131,458.87
1882	1,258,056.80
1883	1,155,181.83
1884	304,294.76
Total	$9,936,507.29

The Syndicate.

The Syndicate mine bids fair to prove the old reliable in every sense of the word. Although working for years upon low-grade ore of a character that other mines dare not handle and would cast over the dump, yet it has constantly added better facilities for ex raction and milling and has steadily increased its yield. Her output in the past year is something to be proud of, and Superintendent R. K. Colcord has proven conclusively what can be accomplished by careful management and close calculations. There were extracted 14,096½ tons of ore, all of which was reduced, yielding an average of about $11.29 per ton. The cost of reduction, etc., amounted to $8.03 cents per ton. The mill run steadily the entire year, with the exception of 60 hours—24 of which was on the Fourth of July.

BULLION OUTPUT OF SYNDICYTE MINE IN 1884.

	Gold.	Silver.	Total.
Jan	$14,214.47	$1,020.28	$15,234.75
Feb	13,705.64	917.96	14,623.60
March	11,905.99	871.82	12,777.81
April	11,567.54	851.95	12,419.49
May	12,506.48	927.38	13,433.86
June	13,773.89	940.51	14,714.40
July	13,144 07	916.42	14,061.09
August	12,453.40	803.70	13,257.10
Sept	11,491.20	760.20	12,251.40
October	10,031.85	713.39	10,795.21
Nov	9,363.03	642.51	10,005.14
Dec	10,890.88	778.63	11,669.51
Total	$145,099.61	$10,144.75	$155,244 36

OUTPUT OF THE SYNDICATE MINE TO DECEMBER 31, 1884.

1879	$12,316.18
1880	24,769.75
1881	134,706.30
1882	75,458.29
1883	92,039.96
1884	155,244 36
Total	$494,534.84

The Bodie Consolidated.

The year 1884 has added one more memorable peg in the annual list of excitements, to which this mine has been subjected. By careful reference to the tables, it will be seen that she made her maiden effort—the biggest of all—in 1878, and in the following year done even better than in 1884. Then followed several years of prospecting with a moderate yield of bullion, and a few assessments, after paying dividends to the extent of $1,295,000. One year ago the stock ran up from 80 cents to $16 and over. A large quantity was taken in the town of Bodie, and the general opinion prevailed that the manipulators would allow it to reach the old-time figure of $75, before the stock was watered. While the hears appear to have got the best of it and continued hoss of the situation, the present management deserve credit for withholding $100,000, with which to further prospect the mine. Several large dividends were declared with apparent recklessness last season, but after the first excitement was over, the stock continued firm, with very little fluctuation. Fifteen stamps were employed in the Bulwer-Standard mill, on Bodie ore, from about the 5th of June till the 20th of July. The little Bodie mill down the canyon was employed until the first cold water shut off the water supply. The following tables will show what part the Bodie Con. played in keeping up the record of the district:

BULLION SHIPMENT OF THE BODIE CON. MINING COMPANY FOR THE YEAR ENDING DECEMBER 31, 1884.

	Gold.	Silver.	Total.
Jan	$13,182 20	$18,480 83	$31,663 03
Feb	44,939 25	31,723 27	76,662 52
March	68,572 62	30,565 15	99,137 77
April	73,218 92	22,553 32	95,772 24
May	69,150 02	23,231 15	92,381 17
June	45,781 37	15,933 78	61,715 15
July	26,202 82	10,026 78	36,229 60
August	1,698 89	2,894 15	4,593 04
Sept	2,619 84	3,123 09	5,742 93
Oc ober	1,761 53	1,652 44	3,413 97
Nov	70,910 32	13,127 98	84,038 30
Dec	20,597 00	4,793 46	25,390 46
Total	$438,604 78	$178,705 40	$617,310 18

ORE PRODUCTION OF THE BODIE CON. FOR THE YEAR ENDING DECEMBER 31, 1884.

	Tons.
January	513 35
February	537 43
March	1,478 00
April	1,697 00
May	2,086 00
June	1,639 75
July	902 00
August	.....
September	.....
October	150 00
November	703 35
December	288 00
Total	9,994 88

BODIE CON. TAILINGS WORKED.

	Tons.
August	979
September	756
October	710
Total	2,445

TOTAL OUTPUT OF BODIE CON. MINE TO DECEMBER 31, 1884.

1878	$1,042,236 80
1879	764,007 12
1880	429,817 80
1881	366,105 14
1882	484,890 48
1883	246,820 10
1884	617,310 18
Total	$3,951,247 62

GRAND TOTAL OF BULLION SHIPMENTS FOR THE YEAR 1884.

Standard Con	$304,294 76
Bodie Con	617,310 18
Syndicate	155,244 36
New Standard	17,714 76
Bodie Tunnel	2,075 90
Wagner's Tailings Mill	17,600 00
Virginia Creek Hydraulic Co	21,300 00
Scattering	8,630 00
Bodie Ore	714 00
Total	$1,144,883 96

FINANCIAL BALANCE ON JANUARY 1ST.

Bodie Consolidated	$105,446 19	
Bulwer	77 82	
Mono	19,018 83	

‡Indebtedness $957 and December expenses.

†Indebtedness $125 and December expenses.

TOTAL PRODUCT OF BODIE DISTRICT.

The total product of Bodie District, from 1877 to December 31, 1884, has been as follows:

1877	$ 797,022 80
1878	2,129,732 58
1879	2,556,847 58
1880	3,063,699 13
1881	3,172,749 71
1882	2,217,780 24
1883	1,582,667 08
1884	1,144,883 96
Total	$16,665,383 08

ENGINEERING NOTES.

ELEVATED RAILROADS SAID TO BE UNSAFE.—The N. Y. *Herald* has an article on the danger threatening the elevated roads from the weakening of the iron supports and girders from the crystallization of the iron. It says that engineers and scientists are making the subject more a study, and experiments during the past 14 years substantiate the theory that the best of iron, when subjected to a continuous strain, will lose its fibrous qualities and show a crystalline arrangement of the molecules and becoms as brittle as castings. All authorities agree that the enormous strain to which the elevated track is subjected will cause the iron to crystallize and that the process cannot be detected by any outward signs. Theodore Cooper, the builder of the St. Louis bridge, said to a *Herald* reporter: "No man can say if there will or will not be a horrible smash-up on them some day. I do not care to express an opinion. Undoubtedly the structure is too light. It would have been much cheaper to have built it stronger in the first place, to say nothing of the safety. The road is being strained just twice as much as it was intended to be." Other engineers express similar opinions.

WEAR AND TEAR OF SHIPS.—If a vessel is strictly first-class and is well cared for, she will hold her rating 12 years. Then she must be carefully examiued, and if found in good condition her rating may he continued four years longer. But you will notice before the end of the twelve years that the captain don't carry on sail as he did the first trip. Even with a fair gale the topgallant-sails come in, and the mainsail will possibly be clewed up. If the ship has nged pretty fast, as she will under a captain disposed to drive her, the chances are that the captain gets out of her into a new ship again. A new man takes the old ship, and she drops out of the trade to 'Frisco or China, and carries guano or coal. When a ship has carried cargo for 15 years, even under favorable circumstances, she is an old ship. She is like an overworked man, she totters on her way. In a heavy sea she is longer rising on the swells, for she has somehow lost her buoyancy. Last of all she goes into the lumber trade, and there wallows her way from port to port, until some day her bones are laid upon a lee-shore, or she fails to rise when a heavy wave strikes her.

AERIAL NAVIGATION BY NIGHT.—Those enthusiasts who are sure that we shall soon be navigating the air as comfortably and regularly as we now traverse the sea, will find small comfort in the recent statement of a famous aeronaut, who asserts that no halloon has ever gone over a second sunset. The moment, he says, the sun goes down the gas condenses, and you get through the night better than the day. But the next day, in the presence of the sun, the gas expands and you mount to great elevations; but every mount the halloon makes cripples its power, and it is only a question of hours, if not of minutes, how long you can keep up. If an aeronaut could have 48 hours of night, he could travel a great distance. Unhappily for him it is not always night, and ws must even worry along with daylight and ordinary means of travel awhile longer.

NEW ORLEANS IN DANGER.—Capt. Eads, who has recently made an inspection of the situation, now declares that within two years the Mississippi is likely to be deflected from its present course past New Orleans down the Atchafalaya directly to the Gulf. Only a tough clay bar across Old river intervenes, and that is being rapidly swept out hy the current. The *Times-Democrat* calls earnestly upon Congress to do something immediately to avert the disaster to that metropolis, planting interests of Southern Louisiana, as well as the commerce of the great river. That paper asserts that an expenditure of only $12,000 to $15,000 is necessary to obviate the more imminent danger.

A NEW SIEGE GUN.—Experiments have lately been made by the Freuch Government with a new kind of siege gun of prodigious power. It is described as made of steel, and nearly 30 feet long, and the tube is strengthened with ten coils of plated steel wire one millimeter, or 1-69 inch in diameter. The composition is such that the cannon, after a few discharges, becomes elongated hy three millimeters. The weight of this gun is 50 tons, and it projects a shell weighing 297 pounds, capahle of penetrating armor plates nearly six inches thick at a range of seven and one-half miles.

ASPHALT IN CONCRETE.—A writer in a French contemporary records the very successful use of a concrete for foundations, made partly with asphalt. It is said that the slight elasticity or hard, rubber-like flexure of minute range of this material makes it superior to the hard foundations for engines and machinery where masonry or concrete is nsed. It acts to a small but useful extent as a moderator of shock.

STEEL CARS.—It has been proposed to furhnis the railroads with grain cars huilt entirely of steel. It is said that more grain can be earried with less wear and tear.

USEFUL INFORMATION.

The Philosophy of an Open Fire.

The normal temperature of the human body is 98 degrees Fahr. If it rises much above, or falls much below that, death will ensue. But the human body is a furnace in which the process of combustion is continually going on. Therefore, in order to preserve the normal temperature, the body must continually give off a certain amount of heat. By the laws of radiation, a heated body parts with its heat, more or less rapidly, in proportion to the low or high temperature of bodies near it. Thus, if a hot body be placed near a cold body, the hot body will radiate heat rapidly. If the hot body be near a cold body, the hot body will radiate heat rapidly. If the hot body be near a body less hot than itself, but still hot, it will part with its temperature slowly.

Let us apply this to a room. If you are sitting in a room near a cold wall, you feel what you think is a draft. It is not necessarily a draft. The side of your warm body turned next the wall, parts with its heat rapidly; and you experience a local chill. If you hang a piece of carpet against the wall, the draft is no longer felt, because it checks the rapidity of the radiation. Now, the chief source of heat in the open fire is its radiant heat, and as it warms the walls of the room and the furniture, it takes off any sensation of chill from them, although the air may be comparatively cool.

You must next hear in mind that the proportion of radiant heat, to the total heat given out hy a heated body, depends on the temperature of the body. Thus, with a red-hot piece of iron, or a flame, the great part of the heat given out is radiant heat, whereas, with a body heated to from 150 degrees to 200 degrees, like a hot water pipe, a comparatively small portion is radiant heat. Therefore, when you heat a room by means of hot-water pipes, or hy means of warmed air, the walls do not get warmed in the same proportion, and although the air may feel warm, the walls may remain cold, so that the heat of the hody may he radiated to the walls and give the sensation of chill. The comfort of the open fire is due to the warmth it imparts to the floor, the walls and the furniture. The air of the room is warmed, not by the rays from the fire, hut hy the warmth imparted by those rays to the various objects. Therefore, the air of the room is somewhat cooler than ths walls. Now, there is, undouhtedly, greater exhilaration produced by breathing cool air than hy breathing warm air. This is readily accounted for. One cubic foot of cold air contains more oxygen (because it is condensed) than the same volume of expanded warm air. It is thus desirable that air admitted to a room should not exceed from 55 degrees to 60 degrees temperature, for comfort in breathing.

A REPEATING MATCH.—A match that will strike several times over is certainly an ingenious invention, though it might not prove to be exceedingly useful. Such a match has recently heen invented. The Russian Department of Commerce and Manufacture has awarded a patent to the inventor of a means of so impregnating wood with a certain chemical that, when dried, the matches made from this prepared wood can be used several times over, thus effecting a saving of, it is claimed, at least 75 per cent. A further saving of matches is proposed to he accomplished hy an electric gas lighter, another novelty recently introduced. It consists of a tiny electric hattery which can he attached to a gas burner. The hattery is connected with a little reservoir of inflammahle material, sufficient in quantity to light 60,000 gas jets. One only has to turn on the gas, raise the lighter to it, touch a spring, and the gas is lighted. A man might consider some time hefore he concluded to go to the expense of having the electric lighter fitted up in his parlor, but it would certainly he hetter to expend a few dollars in this way, all at once, than to waste whole harrelsful of profanity as ths result of falling over things in the dark in the usual fruitless search for the match-hox.

THE STUDY OF FINGER-NAILS.—The study of finger-nails, the shape and color of which are said to indicate certain traits of character, is a new occupation. Long and slender finger-nails denote imagination, love of art, and laziness; if long and flat, they are the sign of prudence, good sense and grave mental faculties; if wide and short, of anger and rudeness, controversy and obstinacy; a healthy color signifies virtue, health, happiness, courage and liberality; dry and hrittle nails are signs of anger, cruelty, quarrel, culminating even in murder; curved in the shape of claws, hypocrisy and wickedness; soft, feebleness of mind and body; and, lastly, we are told that short nails, gnawed down to the flesh, signify silliness and dissipation.

IRON FOR BUILDING PURPOSES.—When it is considered to what an enormous extent iron is now used for building purposes, it is somewhat surprising to he reminded hy the death of Mr. Daniel D. Badger, of Brooklyn, that he was the first person in this country to employ it on a large scale in the construction of houses. Mr. Badger early in life established a foundry and rolling mill in Boston, and in 1842 erected in that city the first huilding in the world with exterior columns and lintels of iron. So doubtful were those for whom he built it of the success of this undertaking that they exacted a guarantee that if the iron so used proved unsuited to the purpose, he should substitute other material at his own expense. But he was not required to make the substitution. On the coutrary, he soon had more orders than he could fill, and gained fame and fortune hy his ingenious discovery. Mr. Badger died at the age of 78 years.

NEW SKATING SURFACE.—A new skating surface called "crystal ice," has been invented by Dr. Calantarients, of Scarborough, England. Considering that, after all, ice is merely a crystalline substance, and that there is no lack of substances that are crystalline at ordinary temperatures, Dr. Calantarients experimented with a variety of salts, and after a time succeeded in making a mixture consisting mainly of carbonate and sulphate of soda, which, when laid as a floor by his plan, can be skated on with regular ice skates. The resistance of the surface is just equal to that of ice, it looks like ice, and indeed when it has been skated on and got "cut up" a little, the deception is quite astonishing.

COPYING MANUSCRIPT. The following is a simple way of obtaining copies of writing without the use of a copying press: Mix white sugar with the ink, one and one-half drachms of sugar to one ounce of ink. Use this with an ordinary pen, and place over the writing a moistened sheet of unsized paper; lay both leaves between two layers of cloth; put the whole under a piece of board large enough to cover them; then put a heavy weight on the hoard for a few seconds, and an excellent impression will be found on ths copying paper.

CABLE ROADS.—A leading advocate of the cable railway system declares that its main advantages over the whole method of propulsion by horse-power are as follows: First, increased speed; second, the ahility to provide transportation to the full requirement of the public, even during what are called commission hours; third, cleanliness; fourth, absence of noise caused by the clatter of horses' hoofs; fifth, freedom from snow blockades in winter; sixth, superior construction of the cars and tracks.

GOOD HEALTH.

Wanted—A Sanitary Inspector for the Villages.

[Written for PRESS by I. H.]

The circular issued last summer by the San Francisco Board of Health was so full of wise and timely suggestions that in reading it a dweller in the country was tempted to envy the residents of the city. For, with all our superior advantages for health and length of days, there is one thing we lack—the sanitary supervision which becomes a necessity wherever human heings congregate in towns and villages.

So many dangers threaten the public health in the crowded precincts of the great cities that health officers and sanitary inspectors are appointed for the common defense. But away from these central points every man does what is right in his own eyes; and until the general intelligence of the people shall reach a much higher level than it touches at present, this entire license must he the source of many evils.

I have known a pretty and attractive country town, where, throughout the summer months, the principal street was filled with a noisome and disgusting odor whenever the wind blew from a certain quarter. It suited the convenience of the hutcher to have his slaughter-house in a central locality, and to feed a number of hogs upon the refuse in an adjoining yard. And while the whole community suffered from the nuisance there was no authority which could he invoked to ahate it. As a people we are very jealous—and rightly so—of any needless interference with our liberties, hut in cases like this a strong hand to deal with the offense and the offender would he a great hoon.

The highest medical authorities have declared that the much-dreaded scourge of cholera will inevitably reach our shores within the present year, and in view of this fact some precautions would seem to he necessary for us all. And country villages and farm-houses, which are not exempt from attacks of typhoid fever and diphtheria, need scarcely hope to escape the ravages of this foreign foe.

Impure drinking water is universally conceded to be a fruitful source of disease, an active agent in its dissemination, and in this respect the people of the rural districts are in a deplorable condition. Attention has already been drawn to this subject in the columns of the PRESS, hut it will bear further discussion, particularly at the present time.

A state of things exists among us, and passes unnoticed, because it is so common, which would fill us with horror and disgust, if it had been first discovered among the inhabitants of China or Ethiopia. A man huys a village lot, and proceeds to huild a house and establish a home for his family. His first step is to dig a well, and this he must do, for there is no other water supply. If he strikes an underground stream at a depth of 15 or 20 feet, he considers himself fortunate.

The next thing is to make a deep pit (the deeper the hetter), over which the privy is placed within a stone's throw of the well; and the comfort and convenience of his household are supposed to be secured.

All goes on happily for a time. But one day a mysterious fever breaks out in the family, or a sudden visitation of diphtheria, and it may be that more than one little coffin is carried out at the door. Yet, the sorrowing father never puts this and that together, or asks himself how far he is responsible for the calamity which has befallen him. One of the worst features of the case, too, is that the innocent must suffer with the guilty. It is of little moment that a man may be too enlightened to tolerate such a plague-spot on his own premises, if his neighbors on either side of him persist in poisoning the air and the water.

Is there no remedy? Will not some one in authority try to create a proper public sentiment in this matter? Would it not even be worth while for our Legislatures to spend an hour or two in the discussion of the public health, and perhaps to appoint a public health officer for the country districts? Something like sanitary commission might easily be organized in the smaller towns and villages, and empowered to examine and report upon matters affecting the general safety. Suggestions from such a source would probably carry some weight, and might avail to ward off the threatening danger. It surely seems a matter of importance. Six months hence, it may he too late.

Walnut Creek.

First Aid to the Injured.

Dr. Francis H. Tirrell, in his late lecture, medical series, before the Young Men's Christian Association took for his subject "First Aid to the Injured." The lecturer pointed out the desirability of making one's self efficient for emergencies, and explained that in the larger Eastern cities societies are formed for the purpose of enabling people to render assistance in cases of emergencies or accideuts. They were called the "First Aid te the Injured," and he had been requested to organize such an institution in this city. If it was established lectures would be given on hemorrhage, the treatment of the apparently drowned or suffocated, first aid for those suffering from shock or collapse or kindred subjects. He pointed out that in cases of emergency or accident nothing was so important as to have some one with coolness and information to assume command. Bystanders should leave room for breathing and action; the sufferer should be placed in a comfortable position, with the head raised a little; then an investigation should be made to ascertain what is wrong, and to decide upon the course to be pursued. Next send a written message for a doctor, so that he may come provided with the necessary appliances. In the meantime preparations should be made, but whiskey or hrandy should not be administered in large quantities, for their effect often misled ths doctor. Suggestions were then made in relation to the treatment of those who had fainted or suffered from a suspensiou of circulation, the care of those seized with an epileptic fit, the course to pursue in cases of apparent drowning, the temporary care of cases of dislocation and fracture and excessive hemorrhage. In the latter cases he explained that pressure should be promptly applied in front of the hend of the elbow, in the armpit, behind the knee or just helow the groiu, as the case might be. This pressure could be made with the finger, a knotted handkerchief, a bandage or other means of pressure upon the main artery.

THE HAIR.—Prof. Wilson, of England, is high authority on the hair. He condemns washing it, and advises, instead, thorough hrushing. This promotes circulation, removes scurf and is, in all respects, hetter than water.

Cutting the hair does not, as commonly thought, promote its growth. Most of the specifics recommended for haldness, not excepting petroleum, are mere stimulants and are seldom or never permanently successful. Some of them give rise to congestion of the scalp. When a stimulant is desirahle, ammonia is the best. It is safe.

For falling out of the hair, Dr. Wilson prescribes a lotion composed of water of ammonia, almond oil and chloroform, one part each, diluted with five parts alcohol, or spirits of rosemary, the whole made fragrant with a drachm of oil of lemon. Dah it on the skin, after thorough friction with the hair brush. It may he used sparingly or abundantly, daily or otherwise.

For a cooling lotion, one made of two drachms of borax and glycerine to eight ounces of distilled water is effective, allaying dryness, subduing irritahility and removing scurf.

Both baldness and grayness depend on defective powers of the scalp skin and are to be treated alike. What is needed is moderate stimulation, without any irritation. The following is good; rub into the hare places daily, or even twice a day, a liniment of camphor, ammonia, chloroform and aconite, equal parts each. The friction should he very gentle.

THE BRAIN AND THE TEETH.—The French medical journals have recently been discussing the relation of teeth to the brain, and their conclusions are of considerahle importance to brain-workers. It seems to have been clearly established that excessive and prolonged mental labor causes the teeth to decay by consuming the phosphates which would otherwise nourish the dental structures.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SUTTER CREEK.—Amador *Sentinel*, Feb. 7: The Amador Con. mine has finished sinking and reached a depth of 1500 feet. They are now running a cross-cut north and have encountered some very good rock. The Lincoln is still running and hoisting rock from the 100-foot level.

EUREKA.—Cor. Amador *Ledger*, Feb. 7: Sinking at the Eureka was finished several days ago. A drift has been run east a distance of 30 feet, where a body of quartz was encountered, the extent of which is as yet unknown. They have cut into it six feet, without getting through it. Judging from the general appearance of the rock, those that are well posted on such matters consider it of good paying quality, although the result of actual milling alone can settle this point beyond dispute. Slowness is still the order of the day at the Mahoney. There is about 100 feet of water to be taken from the shaft yet, and as there is only one pump running, it will be some time before the bottom is reached. The company have been at an outlay of something like $10 per day for many months and really nothing has been accomplished.

LAMBING.—The Lambing mine has started up again, employing about 20 men. To persons interested in mining a visit to this locality is exceedingly interesting, illustrating what pluck and determination may accomplish. About 30 feet of the surface is first removed, exposing the gravel bed, which is said to be exceedingly rich. Supt. Lambing will put on about 75 men some time during the montb.

REDEEMED.—Amador *Dispatch*, Feb. 7: The money was received a few days ago from Boston to redeem the Kelly mine, which was sold at sheriff's sale several months ago, and it is presumed that the Company will resume work in a short time. W. G. Anderson, of the New York mine returned from below last Sunday whither he went to purchase iron for laying a track at the mine. Work at the mine is progressing with a vim and the prospects are very encouraging.

Calaveras.

MILL STARTED.—Calaveras *Chronicle*, Feb. 7: The gravel mill on Tunnel Ridge, owned by Veith and Company, was started last Saturday and we look for good results.

Inyo.

COLUMBIA MINE.—Inyo *Independent*, Feb. 7: At the beginning of the year Frank Silva made a relocation on the Columbia mine, at Darwin, a claim on which a good deal of work had been done some years ago, but which had been abandoned in the interval. Silva began work at some distance from the old shaft, and after clearing away some loose stones and earth, struck a vein of good ore. He now has a new shaft down about 40 feet, and at that depth the ledge is two and a half feet wide, and the ore is of good quality.

WHITE HILL MINE.—Alexander, Barnes & Kehoe are loading cars with ore from their mine, the White Hill, in Beveridge district. The ore will be sent to Selby & Co., San Francisco. Mr Alexander reports the mine looking well. He says, "If it keeps up its lick we're all right."

LUCKY JIM MINE —Mr. J. S. Corman has men at work in the Lucky Jim mine, at Darwin. A good supply of ore has already been got out, and the furnace will soon be started for a run.

El Dorado.

TUNNEL.—Georgetown *Gazette*, Feb. 7: Mr. Clark is still engaged in extending the tunnel in the Graves mine at Volcanoville. Some two years ago an attempt was made by a company to discover the extension of the rich ore chimney taken out to a depth of some 80 ft several years ago, by running a tunnel, but the company failed to tap the ledge. Since that time Mr. Clark has done considerable drifting to the right and left in search of the lost lode, without success. Recently he got it into his mind that the tunnel had not been driven far enough ahead, made a careful survey of the distance, which strengthened his opinion ,and now the energetic miner is driving the tunnel ahead with a vim.

Mariposa.

HORNITOS.—Cor. Mariposa *Gazette*, Feb. 7: Every week some new diggings are found, and new quartz veins discovered, still no mine in the county has been entirely developed. While the days of '49 are for many others, a thing of the past, the millenium is still to come for us. Gold is daily brought into our village, and not later than last week a pocket of nearly $2,000 was struck within the town limits.

Nevada.

CHAMPION MINE.—Nevada *Herald*, Feb. 5: A crushing of nearly 30 tons of quartz from the Champion mine has just been completed at the Deadwood mill, and the results, we are informed, were very satisfactory. There was a large amount of sulphurets saved, which is valued at $125 per ton. All operations at the Champion have been suspended, to await the outcome of the lawsuit now pending between the Champion Co. and the Wyoming Co.

NORTH STAR MINE.—Grass Valley *Union*, Feb. 7: The steam pump which is in use in relieving the North Star mine of water, has been throwing a large and almost constant stream for several months and has finally cleared the 500 level, which is the most extensive opening in the mine and held a great body of water. Yesterday the work of putting in a 16-inch plunger pump from the surface to the 500 level was commenced, which will take about one week to put in place. This pump, which is a massive affair, will be permanent, taking water from a tank at the 500. Below that level the steam pump will be used in draining to the bottom of the mine, after which a 12-inch pump will be used to force the water up to the tank on the 500 level. After the big pump is in place the work of pumping out the lower levels will go on much more rapidly, as the openings are not so extensive. In the course of two weeks a force of tributers will be put to work in the stopes of the 500 level, and as the other levels are drained the number of tributers will be increased, so that it is expected that several hundred men will be engaged in taking out rock in the course of a couple of months. The hoisting and pumping works of the North Star are of the most complete and substantial character, and the engines powerful enough for all demands that will be made upon them. Everything about the mine is put up for the permanent working, as the amount of ground yet to be opened up will require many years.

DUMP WORKERS STOPPED.—*Tidings*, Feb. 7: For a long time past a crowd of young boys have been picking out the quartz in the waste rock from the old dump of the closed-down Eureka mine, and having it crushed at the custom mills. Some of the ore taken from this old dump would go as high as $28 per ton. The boys would take every piece of rock that had a stringer of quartz in it, would accumulate a load of it and then have it hauled to the mills. By this means the boys did a great deal toward supporting poor families, and were perfectly delighted with their prospects. Some of them asked our reporter, months ago, not to speak of their success, for they were afraid of being stopped. We kept this secret faithfully. But a change has come over the spirit of the boys' dream. Some person here has informed Mr. Robert F. Morrow, the San Francisco capitalist, about the dump-pickers, and as he has the management of what is left of the Eureka, he has ordered the boys to cease their work or else pay a percentage for the gold.

Sierra.

A GOOD CLAIM.—Sierra *Tribune*, Feb. 4: The Belmont ledge at Poker Flat is proving itself to be a veritable bonanza. Poker Flat can lay claim to one of the richest quartz ledges ever uncovered in this county. The Belmont was located a number of years ago, and at various times since, considerable work has been done upon it. Last Thanksgiving, however, the parties discovered gold in the rock of sufficient quantities, to warrant them in pushing ahead work with renewed energy. The more work they did on the ledge the better prospects they obtained. A few weeks ago they commenced pounding out the ore in a hand mortar, and in three days took out $1,500. It is not known how much they have taken out in addition to this amount, but it is stated to be quite large. Two tunnels have been run on the vein. The upper tunnel is in 40 feet, and the lower one about 100 feet. Fifteen feet from the mouth of the upper tunnel a shaft has been sunk to a depth of forty feet, and it is from there that the ore has been taken. Only the very rich specimens have been pounded out in a hand mortar. The balance of the quartz has been placed in a dump, and as the ledge is from three to four feet in width, considerable ore must have necessarily been taken out in sinking the shaft. The whole vein shows very rich rock, and the owners cannot be mistaken in placing the value of that already in the dump at a high figure. The upper and lower tunnel are about ninety feet apart. The ledge is easily traced for a long distance on the surface. About one-quarter of a mile distant from where the Belmont Co. are working (on the opposite side of the creek), another party has recently obtained some fine prospects on the same ledge. It is the opinion of experienced quartz miners who have examined the Belmont workings, that the rich chimney now being worked is a permanent thing, and will extend down to an indefinite depth. The width of the pay chute at present being worked is not yet known, but work is being driven ahead in both tunnels night and day. It is the intention of the parties to erect a suitable quartz mill in the spring, and a site is now being cleared for that purpose. The lucky owners of the Belmont are P. R. Gardner & Son, M. Barth, J. Haas, M. Bowers and Fred. Herman.

DRIFTING RESUMED.—*Mountain Messenger*, Feb. 7: The B. M. Extension Company, which stopped drifting three weeks ago, in order to finish its incline, finished that work last Sunday, and on Monday put on 40 men. The incline is 260 ft in length, with a pitch of 1 foot in 4, making the perpendicular rise 65 ft. The upper part of the incline for a little more than half the length, has a double track, while the lower part has only a single track. At the junction of the double and single track there is an automatic switch, which is set by the descending loaded cars. The drum is two feet in diameter and is 25 ft from the head of the incline. Two steel ropes, half an inch in diameter, and each 300 ft long are used, unwinding from the center of the drum towards the ends. The break used is an ordinary strap-break, having a compound lever attachment, making it automatic to the extent that it will, by its own weight, hold two loaded cars on the incline. The whole outfit worked smoothly from the start, two loaded cars being lowered in about 30 seconds. The double shaft through which gravel was at first taken out, has been utilized by placing in one of the compartments an air-blast. The air which comes in through 6,000 ft of 11-inch pipe, is taken by this air-blast down the 60-foot shaft, and forced up and on into the drifts and tunnels, bring the works, so far as ventilation is concerned, for an indefinite period within the last mentioned distance of daylight. Over three inches of water is now falling in the shaft, which amount will be increased as more ground is opened.

FOREST QUEEN.—This quartz mine, owned by Dr. F. M. Biber, one-quarter of a mile up Slug canyon, is being thoroughly prospected by A. N. Whitelaw and Geo. Fries. The first ledge was found 30 ft in from the mouth of the tunnel. Width of second ledge is 4 ft. The main tunnel is in 120 ft, blasted through red serpentine, striking the ledge between slate and serpentine. A very good prospect was obtained last week. The ore averages about $25 per ton.

BALD MOUNTAIN.—The Bald Mountain Company has discovered some exceedingly rich ground in the bottom of the lava channel, where it crosses the original channel. Prospects of $100 to the pan have been obtained. How much of this rich ground there is cannot yet be determined, but in all probability there is enough to warrant running a tunnel for. The company is now enlarging the single-track incline, to enable it to work to better advantage. The perpendicular depth reached is about 30 feet. Empire Co., at Howland Flat, employ 45 men, and cleaned up 76 ounces last week. Gravel averages two and three dollars per carload. From 70 to 80 ounces are taken out every week. Work is being prosecuted on the Lilliput gravel claims, situated in the main ridge near Milton. These claims were located come years ago by Aaron Bechtel, since deceased, and partially developed by him, but have since mainly passed into the hands of Mr. Holdsworth. Wm. Hanley and H. H. Noble, of the Rainbow mine, came up from below last Sunday. The lower tunnel in this mine has reached the ledge, which gives promise of being as rich as it was in the shaft above. The work of connecting the tunnel with the works above has been commenced.

Shasta.

SUNNY HILL.—Shasta *Courier*, Feb. 7: Sunny Hill, which lies five miles west of Ono, will be a lively mining camp ere six months roll by. Messrs. Patten and Day have bonded some of the mines and are at work now. The mill will be here this week, then shortly, we hope, Wells, Fargo & Co. will have bullion to carry from this place. The superintendent F. W. Day, is an assayer, and thoroughly understands the working of ores containing base metals. H. Caswell, the foreman of the mines, is an experienced man at that business; so with Day as superintendent and Caswell as foreman, we are satisfied, if the ore is to be found, they will make it pay. J. E. Spencer is in Frisco and will return shortly with a mill for his mine; then Sunny Hill will boom.

San Bernardino.

CALICO CROPPINGS.—Calico *Print*, Feb. 8: Considerable improvements have been made on the Occidental mine within the past two or three months. A large ore bin has been made at the southwest end of the mine, above which is a canvas structure in which the ore is assorted. A car track over 1,000 feet long has been laid around the west side of the hill from the north, which terminates at the assorting platform. Ore is taken from the numerous openings and run over this track to the main dump. Four tunnels, ranging from 70 to 300 feet, penetrate the hill from the west and south. Sinking and drifting is progressing at various points, from which fine ore is being extracted. Nothing less than $100 ore is taken to the mill. Frequently rich pockets are discovered that yield thousands of dollars. The extent of the ore bodies is not known. Work is now progressing on a belt of ore 400 feet wide by 600 feet in length. This mine is fast developing into a first-class property. Work is still progressing in the Garfield mine with most satisfactory results. Great caverns have been made in excavating the rich deposits of ore. Between two and three thousand feet of openings have been made in the mine. Several tunnels have been driven in, the longest of which is 1,300 feet in length. The lowest depth is 460 feet, from which point rich ore is taken. The extent of the ore bodies in this mine is immense, and it will require an ordinary life-time to exhaust the mineral, if it is possible to exhaust it. Over 2,000 tons of ore that milled from $100 to the ton and upward have been extracted. It is reported that the King mine is about to erect new hoisting works, preparatory to more extensive operations towards developing the large ore-body believed to exist in the lower levels of the mine. In the mean time it is probable that a diminution of the working force may take place temporarily, and night work be shut down for a short time. But there is everything to justify the belief that, when the proposed improvements are completed, the out-put of the King will eclipse anything heretofore shown in that wonderful ore deposit. J. S. Collins, of Daggett, gave us the following item in regard to mines in which he is interested. In January, 1884, Collins, Carlysle and Garnett relocated the Oriental No. 5 mine adjoining the King, and called it the Jersey Lily. They leased it to Wm. Hale, who commenced work last December. The ledge is from six to eight feet wide and runs towards the King. The ore on top assays 109 ozs. That which has been sacked will not $150 to the ton. The work of breaking down and following the vein on the wall is progressing. These parties also located another claim between the Jersey Lily and King called the Olio. It has a 20-foot shaft, a tunnel in 20 feet and several tons of ore on the dump that assay from $80 to $300, and will average about $90. J. S. Collins, Tom Lee and Wm. Sullivan have located the second claim on the west of the Sue, north of Lone Star. Tunnel is 30 feet in ore. Assays from 50 to 400 ozs. Have been working since December 20, 1884. Sinking is still progressing in the Bismark at a depth of over 100 feet in the midst of a broad ledge of rich ore. A long tramway and chute, and a large ore bin are being built at the south end. Preparations are being made to develop the mine on a large scale.

Tuolumne.

JUMPER.—*Union Democrat*, Feb. 7: The Fitzgerald Brothers have re-opened the Jumper mine, situated about two miles south of Quartz mountain. Considerable wealth has already been yielded by the Jumper, and the boys, having an encouraging prospect, feel confident that there is still money in it. The new steam pump at the Eagle mine is working satisfactorily, and the mine has been drained of water. As nothing now stands in the way, the work of development will be vigorously prosecuted. Some very good rock is being taken out of the 367 ft level of the Lamphier mine. The chute is looking well and gives promises of continuity. The mill will be started up for another run in two or three weeks. Operations on the Riverside mine, about 15 miles above Columbia, have been resumed under the direction of James Barron. A considerable force has been put to work, and prospecting will be conducted by means of a diamond drill.

Trinity.

WATER.—Cor. Trinity *Journal*, Feb. 7: Miners are now all at work with a good supply of water. More storm is promised and is needed to keep up the supply. There is very little snow on the high mountains.

NEW RIVER.—Cor. Trinity *Journal*, Feb. 7: Mild winter so far; not much doing in the mines. The Eureka public are wide awake; hope they will get good returns for the capital invested. Their principal mines are represented as follows: Ridgeway, Geo. Dean, Supt.; Golden Gate, bonded for $11,000, W. W. Webb, Supt.; Hunter & Hoo-che-noo, bonded, J. McCormick, Supt.; Syndicate Company, E. McDonald, Manager. When grub gets plenty and weather permits, all will be at work. Hard Tack is working a few men; arastra running and good clean-up anticipated. Ridgeway has some men to work; about 80 tons of ore on the dump; going to put up a mill in the spring.—T. Baker of the Tough-Nut, says his arastra will be completed before spring; they have about 70 tons of ore on the dump which will go $100 to the ton. Mary Blane is all right; will start as soon as weather permits. Grover Cleveland, owned by A. Powell, C. H. Anson & Co., will be one of the boss mines of New River; they don't blow the horn and don't care about selling; it is "whole hog or none." By the way, allow me to give a hint to your placer miners. Our richest quartz mines are on Slide creek and tributaries, H. S. Soule, before winter sets in, made as much as $6 per day on the top gravel, not getting to bed-rock. F. M. Kerby also placer mined last summer with good results; he did not get bed-rock. The creek from mouth to top has never been worked, except by the two parties just mentioned. It is supposed to be 15 or 20 ft to the bed-rock. I am no judge of placer mines; those who are, say it is a good show, perhaps a fortune for those who have bone and muscle to back them. The ax, hammer and saw are all the go. Lumber, $60 per 1,000, enough can't be had at that. Thanks to A. E. Yocom & Co., their saw-mill will be completed in four weeks. Three towns started—New River City, Larcineville and White Rock. Stores, hotels, saloons, etc., are going up in all three.

BULLYCHOOP.—Cor. Shasta *Courier*, Feb. 7: Commencing with Bullychoop district, which lies mostly in Trinity county, but supplies are purchased at this place, bids fair to be one of the richest mining districts in this section. Haskin Bros. and J. E. Enright have found an exceeding y rich body of ore in the Little Gem mine, of which they are the owners. Joseph Henry and Davis Bros. are running a tunnel which will tap the Pound Cake ledge at considerable depth. The Bullychoop M. Co. took out quite a lot of ore during last summer. Several other good mines in the district, but are not being worked this winter.

NEVADA.

Washoe District.

OPHIR.—Virginia *Enterprise*, Feb. 7: The water is fast draining out from the old Mexican shaft and the surrounding ground on the 500 level. The north lateral drift on the 500 level is being advanced rapidly. It is being run along the west wall and will be continued through the old Mexican and Union Con. ground.

GOULD AND CURRY.—Work below the Sutro tunnel level has been discontinued. The new joint station on the 1000 level of the Bonner shaft is nearly completed. When finished explorations will be made in ground never before prospected.

BEST AND BELCHER.—The joint station on the 1000 level of the Bonner shaft being completed, the Gould and Curry will run a north lateral drift to the Best and Belcher line, and the latter company will extend it through their own ground.

CROWN POINT.—A large amount of low-grade ore is being extracted and sent to the mills on the Carson river. A considerable amount of prospecting is being done at various points for the purpose of opening out new deposits.

YELLOW JACKET.—The old upper levels still continue to yield a large amount of low-grade ore, ore, which is sent to the mills on the Carson river for reduction. Explorations are being made at various parts of the mine.

SIERRA NEVADA.—Preliminary operations have been commenced on Cedar Hill in the old Sacramento ground and work will be started at other points in the same locality.

HALE AND NORCROSS.—The connection having been made in the Combination shaft on the 3000 level, the Hale and Norcross will start in immediately on the work of exploration.

SAVAGE—E-street tunnel is passing through the old stopes and they expect to find ground containing low-grade that will pay for working.

UNION CON.—A drift has been run north from the Ophir on the 500 level, which will open up a large area of ground hitherto unexplored.

COMBINATION SHAFT.—The new hydraulic pump on the 3000 level is doing all the work required of it, and could easily do more.

CON. CALIFORNIA AND VIRGINIA.—Repairs in the main drift on the 1550 level are being made.

BELCHER.—They are extracting the usual amount of low-grade ore and shipping it to the mills.

MEXICAN.—A drift running north from the Ophir on the 500 level is nearly completed.

Indian District.

RICH ORE.—*Silver State*, Feb. 7: L. F. Dunn, who has had two men at work all winter, prospecting in Indian district, has struck some very fine ore, with a good prospect of finding a large body of it, in the Illinois mine. The ore contains chloride and ruby silver, and resembles the rich ore found in the Moonlight mine, which adjoins it, years ago, which was worth over $3,000 per ton.

Eureka District.

SOME OF THE PRODUCING MINES.—Eureka *Sentinel*, Feb. 8: The Bowman, which is now worked by tributers, shipped 11½ tons of ore to the furnaces recently. The Marguerita, another Adams Hill property, shipped 4½ tons of ore to the Richmond furnaces last Thursday. Several tributers are working in the General Lee, on Adams Hill, and on Friday last made a shipment of 7½ tons of ore. In the Dunderberg mine, on Prospect mountain, 14 men are employed. Thirty and a half tons of ore were shipped since the 31st ultimo. The King Lear, on Adams Hill, which belongs to Messrs. Whittenburg & Spencer, shipped 30 tons of very good ore to the furnaces the other day. The Silver Lick, on Adams Hill, which was leased some time ago by some Cornish boys, is producing good ore. Twenty men are at work in the mine. The Phœnix, on Ruby Hill, which mine is owned by a San Francisco company, made a shipment of 8 tons of ore to the furnaces during the past week. The Massachusetts mine, in New York canyon, is said to be a very promising property. From it were shipped during the week 7 tons of ore to the Richmond furnaces. The Oriental and Belmont mine on Adams Hill, which is worked by Messrs. Ball & Poplin, shipped to the Richmond furnaces the past week 10 tons of good milling ore. The Eldorado, one of the Ruby-Dunderberg series on Prospect mountain, is looking well. Mike Moran, who has a lease in the mine, shipped 7 tons of ore to the Richmond furnaces recently. The Hamburg mine, on Prospect mountain, the property of a San Francisco company, also shipped 89½ tons of good ore to the furnaces during the same time. Fourteen tributers are at work in the mine. The Lord Byron continues its shipments. Some 26 men are employed in the mine, but only one shipment of 8½ tons of good ore was made from

it the past week. The assay value of the ore, we understand, was over $100 to the ton. The Mimbres, a property on Adams Hill, which has produced about $20,000, made a shipment on Thursday last of 5½ tons of good ore. The mine has an immense ledge of mineral, from which shipments will doubtless be made for many months to come.

El Dorado District.

MILL RUNNING.—Pioche *Record*, Feb. 4: The mill of the Southwestern Company at El Dorado continues to run steady. The mill of this company has been hammering away for months crushing ore, and the prospect is that it will continue so for months to come.

Hiko District.

EXAMINING.—Pioche *Record*, Feb. 4: Matt. Cullen and Pat Kyan, of Salt Lake and Frisco, passed through town on Thursday afternoon on their way to Hiko to examine a mine there in which Eugene Howell is interested.

Jackrabbit District.

QUIET.—Cor. Eureka *Sentinel*, Feb. 7: Having been over in Lincoln county recently, I thought I would let you know how things appeared there to a wanderer. The county is at present very dull, as her mills and mines are, with a few exceptions, closed down, but her people are hopeful of a revival of matters generally at an early day. The town of Bristol, some 23 miles north of Pioche, is very quiet at present. Why it is so I cannot understand, as the town has fine facilities for reducing ore, and there is a jacket furnace of 20-ton capacity, also a 20-stamp mill, complete in every respect, which cost the owners $85,000. Both mill and furnace are idle, and the town is almost deserted. The business houses are all closed, with the exception of two hotels.

Mount Cory District.

TUNNEL.—Walker Lake *Bulletin*, Feb. 5: The tunnel of the Snow Bird mine is in 175 feet and is now just in the ledge. George McKenzie has sold his interest in the Snow Bird mine to Ed. Kinney. The North Star mine is getting better every day. Men are at work running for the ledge on the Silver Brick. Gallagher is working a force of men on Blanchard's mine, the Welcome. The tunnel is 375 feet and in 20 or 30 feet more the ledge will be cut. It is very rich on the surface, and a number of people will be happy if it holds out in quality. Prospectors are still coming here and everybody is looking for good times.

Mineral Hill District.

MILL CLOSED DOWN.—Cor. Eureka *Sentinel*, Feb. 6: After a long and successful run the mill at this place was closed down yesterday for want of wood, and will remain idle for six weeks or, perhaps, longer, much depending on the weather and state of the roads in the mountains. The company failed to secure a sufficient quantity of wood to carry them through the winter, and the snow is too deep in the mountains to think of getting it now. Quite a force of choppers are busy cutting, and as soon as practicable the contractor will commence delivering his new contract of 500 cords. During the stoppage some necessary repairs will be made about the mill and the machinery, and it is expected that when again started the mill will run uninterrupted until next winter. In addition to a successful output from the tailings, the battery crushed about 250 tons of ore from the Hill.

Sylvania District.

SALE.—Candelaria *True Fissure*, Feb. 7: A sale of a big base metal mine in Sylvania district was recently made to George Storey. The consideration was $10,000.

Santa Fe and Silver Star District.

INCREASED MILLING FACILITIES.—Candelaria *True Fissure*, Feb. 7: The season is near at hand when the yearly operations, during the pleasant weather, will again commence on many small mines in this vicinity and at other points not far distant from the railroad. This will be particularly true of the mines in Santa Fe, Silver Star and the mining districts south of here. The mills at Belleville will soon be prepared to do any amount of reduction of such ores as may be taken out, and the railroad company will make a freight rate that can be but satisfactory. In addition to this, the fineness of good work in the mill mentioned is an established fact, and there will be no need to go outside of the county or away from the railroad to have this work done quickly, effectively and well.

Sylvania District.

BASE METAL.—Walker Lake *Bulletin*, Feb. 7: Sylvania mining district, near the south end of Fish Lake Valley, has many valuable base metal mines. Its lead-silver ores are easily worked, and some time it will be a lively place. It is rumored that George Story recently purchased one of the claims for $10,000 and intends to erect a furnace.

Taylor District.

AT WORK.—Cor. Eureka *Sentinel*: When I got back to Taylor I thought it a lively camp indeed, as work is being actually prosecuted in the Argus Company's ground, or group of mines. The ore improves in quality of grade, and it now exceeds $100 per ton. With their splendid mill and other improvements, the members of the company ought soon to be millionaires, as their ore is within 50 feet of the surface and is worked to the best possible advantage.

Tuscarora District.

NORTH BELLE ISLE.—*Times-Review*, Feb. 6: North drift 150-foot level, has been driven the past week 32 feet. No other work in progress at present.

INDEPENDENCE.—South drift, 400-foot level, has been extended a total distance of 1,002 feet. Crosscut east, same level, has been advanced 23 feet.

NAVAJO.—Station for No. 1 winze, on the east lateral vein, 350-foot level, has been cut out, and the work of sinking the winze to connect with the 650-foot level has been commenced. During the coming week, work will be suspended underground to permit the replacing of a few sets of timbers in the shaft and new sills under the gallows frame, and then the pumps will be started to drain the 630-foot level. Mill has closed down, pending the settlement of the question of reduction of wages.

Willow Creek District.

RICH STRIKE.—*Silver State*, Feb. 7: From parties who come from Willow Creek, we learn that a rich strike has been made in the Emma mine. Mike Leonard and Thomas O'Neal, who leased the mine about two months ago of S. W. and F. M. Ruse, of Winemucca, H. H. McColly, of Willow Creek, have been working along steadily, and now they are taking out ore that has been assayed and found to go as high as $455 per ton. That mine is liable to make some parties rich.

ARIZONA.

TOMBSTONE NOTES.—Tombstone *Epitaph*, Feb. 5: Rumor is rife of a possible heavy consolidation of two fine Cochise county properties. The Little Devil under skillful chloriding, has wreathed its management with angelic smiles. Very high-grade rock was discovered in a south drift from the main shaft of the Independence a few days since. Galena ore in large bodies, samples taken for average from which assayed 84 ounces, has lately been discovered on the eastern slope of the Chiricahuas. You may be credulous, but within the past two months two tons and a half of ore have been sacked from a supposed small mine in this camp that will go $12,000 per ton. Not such a bad county this, if you only catch on. From a gentleman from the lower San Pedro we learn that the owners of the gold properties between Williamson's ranch and Lee's spring (up in the oak openings, ten miles from the San Pedro, elevation 7,000 feet) have just cause for much joy.

BISBEE.—In that gem of copper bonanzas, the Bisbee Queen, a strike was made some four days since of high-grade copper ore on the 500 level, south of the main incline, but how immense is yet to be determined, as since the strike no waste has been encountered in running the prospecting drift.

DOS CABEZAS.—The gold mill at Dos Cabezas is reported to be turning out gold bullion in such style as to indicate a healthy feeling in that section, and cause proper development of the numerous gold-bearing ledges to be found in that district. S. W. Wood, as a mill man, is the right man in the right place.

PUMPING.—Tombstone *Epitaph*, Feb. 4: The great interest now in the big mines here is centered in the pumping machinery. The extensive foundation for the Grand Central pumps has been completed and a large force of men is now employed in putting up the machinery. Mr. E. B. Gage, superintendent for the company, is exercising personal supervision, and the work is said to be, by old miners, the most secure ever erected on this coast. They are putting in the double-line 14-inch pumps with 20-inch sinking pumps. The machinery is said to be by men of experience the most complete that has ever been erected in the Territory. At the Contention mine, of which Mr. S. H. White is superintendent, the machinery for the pumps is now all in and will be ready to start up when the pumps and other machinery of the Grand Central are in position and in working order. The Contention has a double of 12-inch pumps with an 18-inch sinking, with a 500 horse-power and works a cataract, called by engineers a Davy cut-off. When these pumps start up it will create a demand for miners that will give employment to a great many more men than are now employed in this camp and will make Tombstone the liveliest city on this coast.

THE CENTENNIAL.—*Silver Belt*, Feb. 7: On Monday last, we visited the Centennial mine, in company with Superintendent W. E. Spence, and found the report of a rich strike having been made, verified by an inspection of the property. We first descended the main shaft to the 60 foot level. Evidence of pernicious mining done, under a former management, is everywhere observable on this level. There is still considerable ore in this part of the mine, of fair grade, which would pay if milled on the ground. The levels below are filled with seepage water, which, it is thought, can be taken out without much difficulty, and will probably be done soon. The Superintendent expressed the belief that rich ore would be found in the 216 level, which is the extreme depth of the mine. In several stopes between the 60 foot level and the surface there is good ore in sight. Ascending to the surface we were next shown where the recent strike was made. To the northeast of the main shaft on the side of the hill, where the ledge cropped out, a shaft has been sunk about 30 feet, following the dip of the vein, at an angle of about 90 degrees. A tunnel was run from the side of the hill to connect with this shaft at the depth of 12 or 15 feet. The surface indications were not misleading as good ore was struck before work in the shaft had progressed many feet and the vein has widened and the ore has grown richer as depth was attained. It is now about three feet wide and the pay streak—ore that will assay more than 100 ounces—is two feet in width. Some of the ore is very rich. The ore is being sorted and sacked as fast as mined. There is every reason to believe that the ledge is a large one as its trend is in the direction of the stopes, north of the main shaft in which there is good ore. On the opposite side of the aroya in an old tunnel, a cross-cut is being driven with a view of cutting the ledge which is distinctly discernable on the surface.

COLORADO.

GEORGETOWN MINES.—*Courier*, Feb. 5: A mill-run from the Seven-Thirty last Saturday, returned 678 ounces per ton. A ten-inch vein of ore was struck in the Irishman lode, in the Horse Shoe, last week. A mill-run from the Snowdrift last Saturday returned 228 ounces for first-class and 67 ounces second-class. Vivian & Co. and Pope & Co., lessees on the Baltimore, have each had some large mill-runs during the past few days. Five or six excellent shipments were made from the Terrible last week, the ore milling from 50 to 500 ounces per ton. A shipment of ore was recently made from the Saxon mine, which returned 3 7-10 ounces gold, 59 ounces silver and 28 per cent lead. The Victoria tunnel has passed through the body of quartzite and indications point to the near approach of the lode—probably the Cashier. We understand that Col. Baldwin, the new superintendent of the Terrible mine, is doing extensive work in cleaning, improving and placing the mine in condition for future operations. A. G. Elliott has leased the Stover lode, in Cascade district and commenced sinking the 40-foot shaft to greater depth. He has a good streak of ore which mills well in gold and silver. McNulty & Co., who are working the East Rogers through the Junction tunnel, have drifted west on the lode 300 feet and have a quantity of scattered mineral which runs 130 ounces silver per ton in one class. The lessees on the Vulcan mine have some splendid lots of ore ready for the mill. Dalin & Co. made a good shipment this week, but the returns have not yet been made. The mine is said to be looking well. Al. Lyons and Ed. Thompson are still cross-cutting in the Georgetown tunnel for the hanging wall of the Griffith lode. They have run a distance of 15 feet and yet no signs of the wall appear. A drift has been started east on the foot wall. Work has been resumed on the Talisman lode, an extension of the Boulder Nest, owned by F. Huet. The adit, which is in 300 feet, will be driven an additional 50 feet. In the breast is exposed two feet of ore, the character of which is copper and iron pyrites and galena. McVeaty & Co., lessees on the East Rogers, had $2,800 mill-run last Saturday. The first-class returned 490 ounces and the second-class 332 ounces silver per ton. They are working through the Edgar tunnel and have about six inches of mineral throughout a distance of 200 feet in the stope. Cochran & Co. are working in the breast of the 100-foot adit on the Maine mine, and have about three inches of good ore. Lane & Co., 100 feet east of the Cochran lease, also have about the same amount of ore, which mills over $500 per ton. Young, Tallman & Co., working on No. 2 level, are in good mineral. Another car-load of ore was shipped from Conway & Co.'s lease on the Silver Bank level of the Pay Rock mine this week. These lessees are taking out immense quantities of ore. The ore vein is a very large one and is holding out splendidly. The first-class ore runs as high as 500 ounces, and the second-class 150 ounces silver per ton.

GOLD STRIKE IN LEADVILLE.—*Herald*, Feb. 7: Probably the largest gold strike in the history of Leadville, if not of Colorado, was disclosed last Wednesday by the lessees of the Nellie S, on Printer Boy Hill. The ore body which consists of heavy red and dark blue talc matter, was encountered on January 15, but it was kept very quiet until recently. One hundred and thirteen pounds of the talc matter thickly charged with free gold was delivered to the Ore Stamp mill and on Wednesday last a gold button weighing 21¾ ounces, and valued at $388, was returned to the lessees, H. C. Rose, C. D. Coleman and Wallace M. Mercury. This would give it a valuation of $7,760 per ton. The red sand after several assays, shows an average of 31 ounces of gold to the ton, or $558. The ore body was exposed in an upraise and about 25 feet from the surface of the hill. The miners are wild with excitement, as it is regarded as the most important strike in years. The property is owned by Lieutenant Governor Peter Breene.

IDAHO.

THE MCLELEN STRIKE.—Wood River *Times*, Feb. 7: A gentleman who visited Bullion yesterday, to verify the *Times'* report of a big strike in the McLelen lode, returned last night. He states that the vein now shows 18 good inches of solid galena ore, which assays 400 and 438 ounces per ton. The second-class stuff adjoining goes 250 ounces, and all kinds will probably average all of 200 ounces at the sampler. The McLelen is undoubtedly a continuation of the Mayflower, which it joins at the north end but shows up even richer than that famous mine at the same stage of development. Nick Millich, the lessee, who is working 16 first-class miners, will realize quite a snug sum from his lease, as he can, within five or six weeks, if the vein continues to show ore as it appears it will do, begin extracting at the rate of $10,000 to $20,000 worth per month.

THE BULLWHACKER INCORPORATED. The Bullwhacker group, on Deer creek, has been incorporated in Philadelphia, and operations at the mines will be resumed early in the spring, and vigorously prosecuted. The Bullwhacker shows a continuous ore vein for over 100 feet.

MONTANA.

MOUNTAIN VIEW.—*Butte Miner*, Feb. 4th: The shaft on the main vein is now down 638 feet. Two levels have been run on the 500 and two on the 600. The south vein averages 100 feet in width, and the main ore body is 30 feet. Work is being done at present on the north vein. On the 500 a body of rich ore 17 feet wide has been struck. It averages from 26 to 50 per cent copper, and is shipped East. The chute is over 300 feet long so far as prospected. Ten thousand tons of second and third-class ore lays on the dump, but the first-class is all shipped East for treatment. The mine is working 16 men, and is hoisting good ore daily. Charles Larable is the owner.

THE CUSTER.—Mr. Geo. Fitschen has just received his certificate of battery assays for eight tons of ore shipped to the Amazon mill at Boulder, from the Custer mine at Basin. The property is owned by Fitschen, Peter Pfeifer and Charles Smith.

THE ZELIA, situated on the hill just east of Centreville, is working 12 men at present. The mine is owned by Wartenweiler and Kellog, and is under lease to Melvin & Kirmil. The shaft is down 100 feet and 2 levels have been run, one 200 feet west and the second 40 feet east. The men are extracting good ore from the four-foot vein, which is being milled.

CHIEF JOSEPH.—This mine, owned by Stewart Lowry & Co., has been leased to Reynolds, Edwards Maddern, Job and Holman. Eight men are employed on the claim, and rapid development is going on.

WILD BILL.—The ore is exceedingly rich—far more so than any other body ever found in the mine. The new vein tends more north and south than the other veins, and has every indication of permanancy. It is rich in copper, and at present the only ore raised comes from the new find.

RISING STAR.—The new hoist is approaching completion. In the mine the men are sinking from the 400 foot and drifting from the same level, but no ore is being raised.

THE JOSEPHINE.—Gold and silver property has been bonded to the Chrystal Mining Company, of San Francisco, for three months, $50,000. The company have also leased the mine for six months, and will begin work as quickly as the machinery can be erected. The mine is in Pipestone district, about four miles from the warm springs, and is owned by McBride, Headley & Co.

THE LITTLE MINER has been sold to San Francisco parties, providing the mine proves up as represented. The purchasers will arrive this week and examine the property thoroughly.

THE GOLD HILL LODE, owned by the Chris Weibold estate, and handled by Henry Weibold, has just been bonded for $20,000 to the Gould & Curry Co., of San Francisco, for one year. The same company also have a lease on the mine for the same length of time.

HARRIS AND LLOYD TUNNEL.—This property is bonded to C. C. Tripp, of San Francisco. Active work in the tunnel will be resumed about the middle of the present month. Work was commenced in November last, but owing to the depression in copper, the work ceased.

THE BELL is running a full force of men in the smelter. The rich ore coming from the mine at the rate of 100 tons per day cannot be handled at the smelter, and the company have been compelled to hire the old Parrott smelter's calciners. Three of the roasters were started up a few days since, and two more of the calciners will be started this morning.

NEW MEXICO.

GOLD HILL.—Cor. Silver City *Enterprise*, Feb. 6: Miller & Gibbons are on the eve of starting up their arrastra. They are now packing their ore to same so as to give it a fair test. Black & Parks are packing ore preparatory to shipping from the Golden Chief to the flat, where it is loaded on wagons to be delivered and worked at the Pinos Altos mill by Place & Johnson. Samuel & Henry have their shipment ready from the Bilk. Teams are now loading but did not learn the destination of the ore. Derbyshire & Clark are about to move to camp Lewis, where they have an extension of the Grand Tower, the property of Messrs. Lewis & Cottrell, which is daily looking better. Snyder & Snowden are piling up good ore on the dump of the Fraction, which appears to be of an excellent quality. George Goodwin's claims, the Yankee Boy and Dunderberg parallel, are producing some as fine ore as can be found in the country. He has ore that averages $1,600. There are no less than 13 claims preparing to ship ore, which certainly speaks well for a six months old camp. There is one of the best openings for reduction works here and an investment that with proper management could be made to pay a good per cent; it need not lay idle a day. Would like to see some mill men come into our camp and see for themselves that we are making no idle talk.

COW SPRINGS.—The Cow Springs mining district is attracting much attention in mining circles just now. The Carlisle company have $200,000 worth of tailings on hand, which will be treated at an early day. A shipment of 15 tons of ore from the Graphic mine at Cook's Peak, owned by Hudson & Taylor netted over $100 per ton to the owners. Regular shipments from this and other claims in Cook's Peak district are being made to the Kingston smelter, where this ore was treated. Messrs. Forbes & Elliott, owners of the bonanzas known as the Brush Heap and Andy Johnson mines, at Kingston, were in town this week and stated that three car-loads of ore are shipped weekly from their property, netting them $50 per ton. They are making more money than they readily spend hence their trip to New Orleans and the East. Colonel Amos Greene is now working ten men on the Galatea mine, which adjoins the Violar in the Pyramid district. This propertyas well as the Colonel, has a history that would be very interesting reading for some people. It is intimated that Louisville people will be let in on some of the Colonel's bonanzas in this country. E. A., better known as "Dutch" Henry, one of the locators of the Old Man mine, is reported to have struck it rich again in the San Francisco mountains. He writes that he has placer mines which he is working, and that pay $5 per day to the man, besides several good locations in the mountains. He will probably not be as lavish with this stake as with the last.

UTAH.

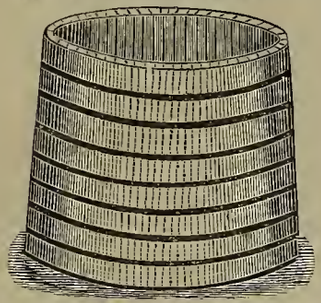
REVIEW.—Salt Lake *Tribune*, Feb. 6: The shipments of bullion and ore for the week ending Saturday, January 31st, inclusive, were as follows: 30 cars bullion, 660,588 lbs.; 20 cars ore, 549,068 lbs. Total, 1,210,068 lbs. The receipts of bullion and ore at the banks of this city for the week ending February 4th, inclusive, amounted to $122,401.31, of which $99,942.87 was bullion, and $22,458.44 was ore. The week previous the receipts were $70,071 in bullion, and $24,331 in ore. The receipts of bullion, exclusive of ore, for the month of January, were $378,644.56. The Ontario shipped during the week fifty-one bars of bullion, assaying $33,980.61. Total for year to date, $150,555.59. The Horn Silver furnaces are still turning out bullion in quantity and quality about as usual, but no shipments are made; the bars are piled up at the works. The Silver Reef district yielded $11,010 in silver during the week, of which the Christy supplied three bars ($5,930), and the Stormont four bars ($5,930). The Germania smelter turned out twenty-two cars of bullion ($48,671.26). The Crescent yielded ore to the value of $8,230 during the week.

STAR DISTRICT.—Frisco *Times*, Feb. 5, The Martin Bros. were in from Star on Thursday. They report mining in that district active. There are more men at work and prospecting than for many years past. The Don is being actively developed by its owners. Mr. Campbell has six men at work on the Moscow, the mine he recently bonded, besides a force on the Red Warrior. The Martin Bros. are doing profitable work on some of their mines. It is now confidently asserted that Mr. Campbell will shortly erect a concentrator and leaching works in Milford. If such be the case, it will be the means of creating a mining boom for Star, equal to, if not greater, than that of '72 and '73. With the proper facilities for the reduction of ores, Star is capable of supporting more men than any other district in Beaver county, not excepting San Francisco district, the seat of the justly famous Horn Silver mine.

UNION COMPANY.—The claims of this company adjoin the Crescent on the north and work is being done on them at present by Mr. David Avery who has a contract for sinking a shaft on them.

CRESCENT.—A visit to this celebrated property showed everything to be in fine working trim. The mine is still keeping up its record for being the largest producer of ore in the camp. There are at present some 90 men employed in the mine and it produces over 60 tons of first class ore and some 50 tons of concentrating ore per day. The first-class ore is shipped by teams to the sampler and the second-class is placed on a dump by itself at the end of the tramway where it will be handy for loading on the tram cars when the track can be used.

WATER TANKS.



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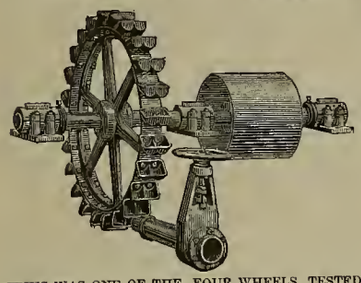

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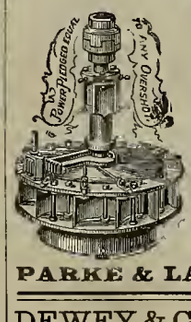

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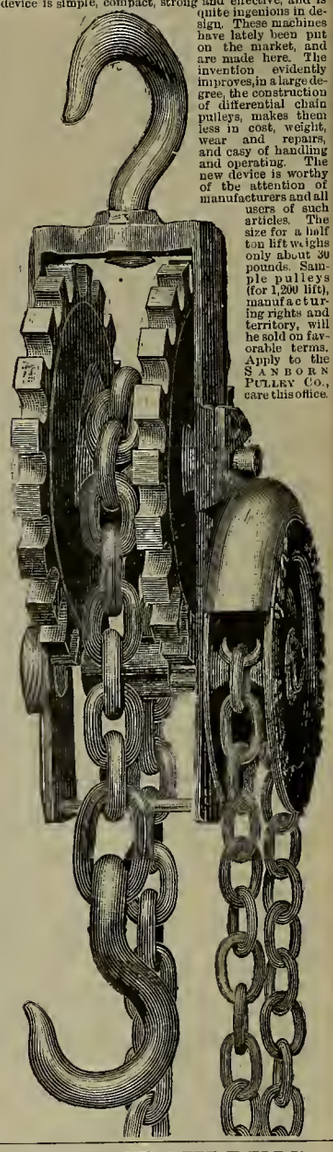

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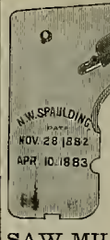

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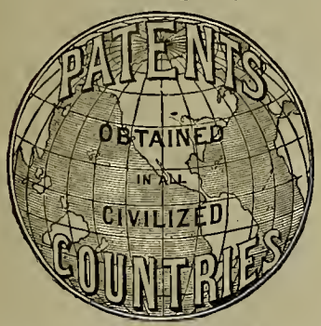

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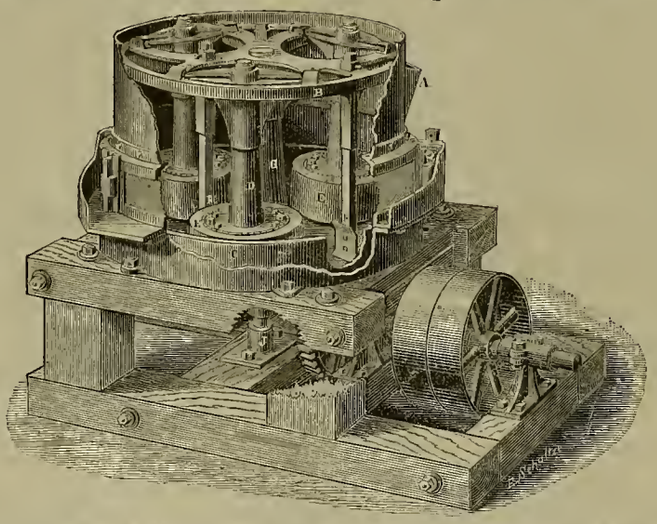

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Mining Bills.

Very little has so far been done by the Legislature of interest to the mining community. In fact very few hills of any kind have been passed, though the session has not much longer to run. One hill, introduced in the Senate by Cross, of Nevada county, allows corporations to build dams and other works to restrain and impound mining debris. Places for the deposit of such debris may be condemned and taken by such corporation in the mode provided hy law for taking private property for public use Under tbis Act corporations shall act through their president, with the consent of at least two-tbirds of the stockholders. Each subscriber to such "articles" shall give a description of the water rights and ditch property owned by him or the corporation which he represents, and all subsequent subscribers shall give a like description; and such descriptions shall he duly recorded in the office of the county recorder in the county in which the property is situated; and such record shall he notice of the liens and rights of the corporation and the creditors thereof.

Rather a curious feature of this measure of Mr. Cross' is the provision that the uumber of shares of stock in such a corporation shall be equal to the estimated number of miner's inches of water which will probahly be discharged from the mines into the stream above the point where the impounding works are. Each subscriber of stock in the corporation shall take such a number of shares or stock as the numher of inches or units of measurement of water appropriated by him or the corporation he represents, to he used above the impounding works, hears to the whole capital stock of the corporation. Companies formed under the Act may levy such assessments as may he necessary to construct and maintain restraining dams, hut 10 per cent of all assessments must he paid into the State treasury, to be invested in State or Government honds to constitute a sinking fund to keep tbe dams in order in case the company should hankrupt. Provision is also made for fiue and imprisonment of persons who shall discharge into the stream above the works, rocks, stones, sand, gravel or earthy matter.

During the week the Assemhly has passed the bill to maintaiu the State Mining Bureau, hy which a regular appropriation is made by the State, and the institution does not have to depend, as now, on the proceeds of the tax on certificates of mining stock. The commissioner to the New Orleans Exposition proposes to spend $2,500 of the $10,000 which has been voted by the Legislature, towards exbihiting the State minerals at New Orleans. It is not, however, certain that they will he moved from here.

In the last number of the PRESS we gave the various bills concerning water rights which have been introduced. We also gave the Reddy bill providing for two shafts in mines for the safety of miners.

The following is the so-called "slickens" bill, which is now occupying the attention of the House, and which will cut a prominent figure in the legislation of the session:

SECTION 1. The State Treasurer is hereby authorized and required to pay all warrants outstanding and unpaid in their order, as drawn hy the State Controller, in accordance with "An Act to promote drainage," approved April 23, 1880, upon the construction fund of Drainage District No. 1, and all warrants drawn upon the State drainage construction fund, out of each fund respectively; provided, that if there is not money enough in said funds to pay all of said warrants, theu he shall pay the remainder of said warrants unpaid out of any money in the general fund not otherwise appropriated.

SEC. 2. The State Controller is herehy authorized and required to draw his warrants for all claims against Drainage District No. 1 that have been heretofore audited and allowed by the State Board of Drainage Directors; also all claims against the State drainage construction fund that have been heretofore audited and allowed hy the said State Board of Drainage Directors; and the State Treasurer is herehy authorized and required to pay the same out of any money in each fund, respectively; provided, if there is not money enough in said fuuds to pay all of said warrants, then the State Treasurer shall pay the remainder of said warrauts unpaid out of any money in the general fuud not otherwise appropriated.

SEC. 3. All persons having claims for work done or materials furnished under the provisions of "An Act to promote drainage," approved April 23, 1880, are authorized to present their claims to the State Board of Examiners. All claims so presented shall be itemized, and verified by the claimants, his heirs or assigns. The State Board of Examiners shall audit and allow said claims, either in whole or in part, or reject the whole, as they may deem just and proper, and certify the amount so allowed to the State Controller, who shall draw his warrant in favor of each claimant for the said amount upon the State Treasury. The State Treasurer is authorized and required to pay the same out of any money in the general fund not otherwise appropriated.

SEC. 4. The sum of $43,108.26 in the State Treasury to the credit of the State drainage construction fund, and the sum of $21,048.75 in the State Treasury to the credit of the construction fund of Drainage District No. 1, and the sum of $190,000 in the State Treasury not otherwise appropriated, is hereby appropriated to pay the warrants mentioned in Section 1 of this Act, and those authorized to he drawn in Sections 2 and 3 of this Act.

SEC. 5. This Act shall he in force and take effect from and after its passage.

Comparative Safety in Mines.

The result of rather a curious competition among mines has just heen announced. Some ten years ago, in Belgium, a memher of the Association of Engineers from the school at Liege founded a prize to he awarded to the managers of the fiery colliery in which the least numher of deaths from explosion should take place in ten years. To this end, he gave the sum, of 5,000 francs, which, with the accumulated interest, now amounts to ahout 8,500 francs. To this sum the Government added 5,000 francs.

Last year a jury was appointed to decide the question and they have, after thorough investigation presented their report. The prize has now been presented, the fortunate colliery heing that of the Nord de Charleroi, No. 3 pit. The second prize was gained hy the Ougree, and the third hy the Grisenil collieries. In the awarding of this prize, the difficulties to he encountered in prosecuting the operations of mining were to be taken into account. The conditions of the competition excluded all pits in which fewer thau 250 men were employed in underground work. Ninety collieries entered the list as competitors, but only one-half of this number kept up the minimum number of underground hands. The deaths from explosion during the deccenial period were two for No. 1, four for No. 2, and nine for No. 3. These numhers gave per 1,000 men employed 0.59, 1.03, and 1.33 respectively. If we omit one of the competing collieries, that of Agrappe, in which the number of deaths was, chiefly in consequence of a very disastrous explosion, 269, the mean number of deaths from fire-damp explosion in the 43 pits during the period of ten years was 23.33; which gives a proportion of 2.48 per 1,000.

Mining Share Market.

There is little new to report concerning the stock market, and our tables show what slight fluctuations have occurred. According to the statements made to the *Enterprise* reporter by the officials of the middle Comstock mines, there should have been a rise in prices instead of a falling off, from the fact that the connection made on Thursday on tbe 3000 level of the Combination shaft is an important event, and gives great encouragement to the managers of tbe mines, who say that tbe ground just opened is of the most favorable nature, being mostly good-looking quartz. The Chollar ground is of a swelling character, but indicates good pay rock. Although the connection was made last Thursday, it will take several days to square up the drift and get ready for cross-cutting. The hydraulic pumps are working splendidly, and can run ten strokes a minute without any trouble. The circulation of air is good, and the work of exploration will begin as soon as possible. At the North End mines everytbing is going on about the same as usual, with the exception of extra men being employed at the Sierra Nevada in making repairs to machinery and putting a new foundation for the same. Work on the upper levels of the Sierra Nevada will be commenced as soon as the necessary repairs have been completed on the surface.

Bullion Shipments.

Alhambra Hill, February 5, $8,061; Wood River ore, 3, $2,184; Ontario, 3, $6,080; Christy, 3, $1,700; Queen of the Hills, 3, $1,800; Mayflower, 3, $1,850; Eureka, 3, $1,750; Crescent, 4, $3,130; Christy, 4, $1,800; Ontario, 4, $21,714; Stormont, 5, $2,680; Crescent, 5, $2,900; Eureka, 6, 1,000; Stormont, 6, $3,200; Vienna, 6, $2,000; Christy, 6, $2,894; Ontario, 7, $14,750; Minnie Moore, 8, $1,490; Navajo, 9, $12,000. During the week ending February 7th there were shipped from Salt Lake 27 cars of ore, 732,010 pounds, and 15 cars bullion, 350,319 pounds, making a total of 42 cars, aggregating 1,082,329 pounds.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alpha Con M Co	Nevada	19	50	Jan 20	Feb 26	Mar 21	W Willis	309 Montgomery st
Acme M and M Co	California	8	12	Jan 14	Feb 20	Mar 13	J M Buffington	309 California st
Arnold M Co	Arizona	3	1 00	Jan 3	Feb 7	Mar 2	A Judson	320 Sansome st
Belmont M Co	Nevada	39	15	Feb 1	Mar 21	Apr 13	J W Pew	310 Pine st
Black Bear M Co	California	2	25	Dec 20	Feb 20	Mar 17	W L Oliver	328 Montgomery st
Bulwer Con M Co	California	1	20	Jan 13	Feb 24	Mar 31	W Willis	309 Montgomery st
Butte Creek H M Co	California	11	10	Jan 30	Mar 9	Mar 31	R L Taylor	230 Montgomery st
Cueva Santa M Co	Mexico	5	25	Jan 22	Feb 27	Mar 29	W L Oliver	328 Montgomery st
Champion G M Co	California	18	10	Jan 28	Mar 6	Mar 26	T Wetzel	522 Montgomery st
Caledonia M Co	Dakota	15	15	Jan 27	Mar 9	Apr 6	W L Oliver	328 Montgomery st
Con Virginia and California	Nevada	2	20	Jan 15	Feb 20	Mar 21	A W Havens	309 Montgomery st
Eintracht Cravel M Co	California	17	05	Dec 9	Mar 3	Mar 21	H Kuntz	209 Sansome st
Exchequer M Co	Nevada	21	20	Jan 2	Mar 3	Mar 23	C C Elliott	309 Montgomery st
Golconda M Co	California	1	03	Feb 7	Mar 12	Mar 31	J M Buffington	309 California st
Hazard G M Co	California	6	05	Jan 21	Feb 23	Mar 28	J T McGeoghegan	318 Pine st
Homeward Bound Pl M Co	California	3	15	Feb 21	Mar 12	Apr 6	D A Smith	209 Post st
Independence M Co	Nevada	14	13	Jan 21	Mar 2	Mar 30	J W Pew	310 Pine st
Martin White M Co	Nevada	19	25	Jan 15	Feb 25	Mar 25	J J Scoville	309 Montgomery st
Mammoth Bar M Co	California	7	10	Jan 19	Feb 20	Mar 13	J W Pew	310 Pine st
Mayflower Cravel M Co	California	28	10	Jan 20	Feb 27	Mar 20	J Morizio	328 Montgomery st
North Gould & Curry M Co	Nevada	8	05	Jan 12	Feb 13	Mar 2	C H Mason	331 Montgomery st
Peer M Co	Arizona	2	50	Jan 14	Feb 19	Mar 16	A Waterman	309 Montgomery st
Peerless M Co	Arizona	3	50	Jan 14	Feb 18	Mar 14	A Waterman	309 Montgomery st
Potosi M Co	Nevada	17	25	Jan 27	Mar 2	Mar 24	C L McCoy	309 Montgomery st
Savage M Co	Nevada	62	50	Feb 2	Mar 6	Mar 26	E B Holmes	309 Montgomery st
Silver Lining M Co	Nevada	1	07	Dec 16	Jan 24	Feb 19	J. Stadfeld	419 California st
Silver Hill M Co	Nevada	21	15	Jan 9	Feb 13	Mar 6	W E Dean	309 Montgomery st
Utah S M Co	Nevada	52	50	Dec 19	Jan 23	Feb 14	G C Pratt	309 Montgomery s
Virginia Creek Gravel Co	California	1	20	Dec 20	Jan 25	Mar 2	J M Quay	406 Montgomery s

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Copper Mt Con M Co	California	A L Perkins	310 Pine st	Annual	Feb 16
Enterprise M Co		R S Falconer	217 Spear st	Annual	Feb 17
Murchie M Co	California	W Letts Oliver	328 Montgomery st	Annual	Feb 17
North Peer M Co	Arizona	H Deas	309 Montgomery st	Annual	Feb 27
Saratoga M Co	California	M Hubbard	123 California st	Annual	Feb 16

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	B L Burling	326 Montgomery st	50	Dec 5
Coutention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Dec 15
Darbee Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Oct 8
Jackson M Co	California	D C Bates	309 Montgomery st	10	Dec 27
Kossuth M Co	Nevada	C K Sturtevant	328 Montgomery st	06	Mar 16
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Feb 13
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Nov 28
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Feb 16
Syndicate M Co	California	J Stadfeldt	419 California st	10	Nov 6

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON COROM, Sergeant Signal Service Corps, U. S. A.

DATE. Jan 29-Feb 4	Portland. Rain	Temp	Wind	Weather	Red Bluff. Rain	Temp	Wind	Weather	Sacramento. Rain	Temp	Wind	Weather	S. Francisco. Rain	Temp	Wind	Weather	Los Angeles. Rain	Temp	Wind	Weather	San Diego. Rain	Temp	Wind	Weather
Thursday	.14	53	W	Cy.	.00	62	N	Cy.	.00	58	NW	Fy.	.—	57	SE	Fy.	.00	81	S E	Fr.	.00	74	W	Cl.
Friday	.00	47	W	Cy.	.25	63	NW	Cl.	.09	64	W	Cl.	.—	57	W	Fr.	.00	74	S	Fr.	.00	62	W	Cy.
Saturday	.23	46	S W	Fr.	.—	53	N	Cl.	.02	53	NW	Cl.	.00	54	N	Cl.	.00	61	S E	Cl.	.00	64	S	Fr.
Sunday	.—	45	S	Cy.	.00	52	N	Cy.	.00	51	NW	Cl.	.00	55	W	Cy.	.00	65	S W	Cl.	.00	63	W	Cl
Monday	.78	48	S	LR.	.00	54	N	Cl.	.00	52	N	Cl.	.00	55	W	Cl.	.00	64	S E	Cl.	.00	61	W	Cl.
Tuesday	.43	50	S	Cy.	.00	56	N	Cl.	.00	52	NW	Cy.	.00	54	N E	Fr.	.00	64	S	Cl.	.00	62	W	Cl.
Wednesday	.10	51	W	Cy.	.00	58	N	Cy.	.00	55	N	Cy.	.00	61	W	Cy.	.00	67	W	Fr.	.00	62	W	Cl.
Totals	1.68				.25				.09				.—				.00				00			

EXPLANATION.—Cl. for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature wind and weather at 12:00 M. (Pacific Standard time), with amount of rainfall in the preceding 24 hours.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Jan. 22.		WEEK ENDING Jan. 29.		WEEK ENDING Feb. 5.		WEEK ENDING Feb. 12.	
Alpha	.25	.30	.10	.15	....	....	....	....
Alta	.25	.30	.25	.30	.27	.30	.25	.30
Andes	....	.10	....	.10	....	....	....	.10
Argenta	....	....	....	....	....	....	....	....
Belcher	.70	.75	....	.80	.75	.80	....	....
Belding	....	....	....	....	....	....	....	....
Best & Belcher	.55	1.25	.70	.90	....	.75	.70	.80
Bullion	.15	.20	....	.30	.15	.25	.20	.25
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	....	....	.15	....	....	....	.15
Bodie Con	1.90	2.05	1.90	1.95	1.90	2.60	1.85	2.15
Benton	....	.05	....	.05	....	.05	....	.05
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	....	.10	....	.05	....	.10	....	.05
California	.10	.30	.10	.15	....	.10	....	.10
Challenge	....	....	....	.15	....	.15	....	.15
Champion	....	....	....	....	....	....	....	....
Chollar	1.25	1.95	1.15	1.45	1.45	2.75	2.00	2.65
Confidence	.75	.90	....	....	....	....	....	....
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.10	.30	.10	.15	....	.10	....	.10
Con. Pacific	.90	1.85	.75	.80	....	....	.25	.75
Crown Point	.80	.90	.80	.85	....	.80	.80	.85
Day	....	....	....	....	....	....	....	....
Eureka Con	2.10	2.40	2.25	2.75	2.50	2.75	....	....
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	....	.05	....	....	.22	.25	....	....
Grand Prize	....	....	....	.30	....	....	....	....
Gould & Curry	.50	1.15	.65	.70	.60	.90	.65	.70
Goodshaw	....	.05	....	.05	....	....	....	....
Hale & Norcross	2.40	5.13	2.60	3.95	2.85	4.00	3.40	4.05
Holmes	4.50	4.75	....	4.65	....	....	4.70	5.00
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	....	.10	....	....	....	.13	....	....
Martin White	....	....	....	....	....	....	....	....
Mono	1.05	1.45	1.05	1.20	1.05	1.15	1.00	1.70
Mexican	.25	.50	.30	.40	.35	.38	....	.30
Mt. Diablo	....	3.75	....	....	3.50	3.75	....	3.50
Northern Belle	....	....	....	....	....	....	....	....
Navajo	1.65	1.80	1.60	1.70	1.40	1.65	1.30	1.40
North Belle Isle	.10	.20	....	....	....	.15	....	.15
Occidental	.75	.90	.75	.80	....	1.00	.75	.80
Ophir	.25	.50	.35	.40	....	.35	.30	.35
Overman	....	....	....	....	....	.08	.10	.20
Potosi	.50	.80	.40	.50	.50	.83	.65	.80
Final Con	....	....	....	....	....	....	....	....
Savage	.90	2.00	.80	1.10	.85	1.05	.90	1.00
Seg. Belcher	....	....	....	....	....	....	.75	1.10
Sierra Nevada	.35	.70	.40	.50	.35	.45	.35	.45
Silver Hill	....	....	....	....	....	....	....	.10
Silver King	....	4.00	3.50	4.00	....	3.25	....	....
Scorpion	....	.10	.10	.15	.10	.11	....	....
Syndicate	....	....	....	.45	.35	.40	....	.40
Tioga	....	....	....	....	....	....	....	....
Union Con	.35	.60	.35	.45	.35	.40	.35	.40
Utah	.15	.55	....	....	.20	.55	....	....
Yellow Jacket	....	....	....	....	1.20	1.25	1.20	1.25
	....	....	....	....	....	....	....	....

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Sales at San Francisco Stock Exchange.

THURSDAY A. M., Feb. 12.

2	50	Alta	30c
50		Bodie Con	2.05
20		B. & Belcher	75c
190		Belmont	30c
50		Bulwer	10c
1720		Chollar	2.70@2.75
178		Con Va & Cal	10c
1250		Hale & Nor	3.50@3.90
50		Mexican	30c
120		Navajo	1.35@1.40
650		Overman	20c
50		Occidental	85c
50		Potosi	85c
25		Sierra Nevada	30c
100		Silver Hill	10c
300		Scorpion	10c
15		Seg. Belcher	25c

AFTERNOON SESSION.

600		Alta	30c
200		Benton	05c
400		Bulwer	05c
200		Chollar	2.60@2.65
137		Con Va & Cal	10c
80		Con. Pacific	70c
100		Eureka Con	2.75
530		Hale & Nor	3.65@3.70
160		Mono	1.35
100		Mexican	30c
650		Martin White	15c
400		Sierra Nevada	30c
1100		Savage	80c
50		Utah	55c

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Feb. 12, 1885.

ANTIMONY—Per pound		—	@ —
Hallet's		12½	@ —
Cookson's		13	@ —
BORAX—Refined		7	@ 8½
IRON—Clengarnock ton		23 00	@ —
Eglinton, ton		22 00	@ —
American Soft, ton		21 00	@ —
Oregon Pig, ton		—	@ —
Clipper Cap, Nos. 1 to 4		25 00	@ 30 00
Clay Lane White		26 00	@ —
Shotts, No. 1		26 00	@ —
Refined Bar		3	@ —
Boiler, 1 to 4		5 00	@ 5 50
STEEL—English, lb		16	@ 25
Black Diamond, ordinary sizes		13	@ —
Plow		8	@ 8
Machinery		10	@ 12
COPPER—			
Braziers' sizes		—	@ 25
Fire-box sheets		28	@ —
Bolt		22	@ —
Yellow Metal		14	@ 15
LEAD—Pig		3½	@ 3¾
Bar		5	@ —
Pipe		7	@ —
Sheet		8	@ —
Shot, discount 10% on 500 lbag	Drop, ¼ lbag.	1 85	@ —
Buck, ¼ bag		2 05	@ —
Chilled, do		2 25	@ —
TINPLATE—Oldcastle		5 25	@ 6 00
Charcoal		5 75	@ 6 50
Coke		5 25	@ 5 50
Roofing		6 25	@ 13 50
ZINC—German		9	@ 10
Sheet, 7x3 ft, 7 to 10 lb, less the cask		9	@ 10
QUICKSILVER—By the flask		33 50	
Flasks, new		1 05	@ —
Flasks, old		85	@ —
NEW YORK PRICES—			
California Borax, refined		8¾	@ 8¾
Pig Iron, American No. 1		18 50	@ 19 00
Pig Iron, American No. 2		17 00	@ 17 50
Quicksilver		48	@ 50
Lead		3 50	@ 3 70
Copper		—	@ 11¼
Tin		11¼	@ —
Bar Silver		1 07	@ —

Partner Wanted in a Patent.

I have invented a valuable patent, which has been allowed in the U. S., and want to secure partners to take out patents in foreign countries on reasonable terms, Write to or call on J. PETTINGER, International Hotel. San Francisco, Cal.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING FEBRUARY 3, 1885.

311,462.—FIRE KINDLER—A. Archibald, Santa Maria, Cal.

311,465.—LAMP FILLING ATTACHMENT FOR OIL CANS—W. Bloomfield, S. F.

311,567.—DEAFENING FOR WALLS—L. E. Clawson, S. F.

311,725.—ELECTRICAL APPARATUS—J. D. Culp, San Felipe, Cal.

311,584.—RULE GAGE—Hunt & Bressler, Crescent City, Cal.

311,594.—WATER WHEEL VALVE GEAR—I. Lepley, Amador, Cal.

311,607.—RAILWAY CROSSING ALARM—J. T. Pritchard, Carson, Nev.

311,787.—GATE LATCH—A. G. Rockfellow, Ashland, Or.

311,690.—CANISTER—C. M. Symonds, S. F.

311,693.—INSERTIBLE SAWTOOTH—J. C. Trullinger Astoria, Or.

311,615.—EYEGLASSES OR SPECTACLES—Chas. Slotterbek, Lakeport, Cal.

311,547.—DYNAMO ELECTRIC MACHINE—F. S. Waterhouse, Sacramento.

311,705.—THRASHER—David Young, Stockton, Cal.

NOTE.—Copies, of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise), at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewoy & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

DEAFENING OR FILLING FOR WALLS.—Leonard E. Clawson, S. F. No. 311,567. Dated Feb. 3, 1885. This is a filling or deafening for walls and partitions, and it consists of a filling and a means for introducing it between the studding. The usual manner of filling the spaces between the studding of partitions or walls, for the purpose of deafening and preventing sounds from passing, is by means of detached bricks or blocks of any suitable material. These blocks must be laid up by a mason or bricklayer, at a considerable expense, and some waste of material. Mortar is sometimes used between floors, but in such cases a supplemental permanent floor is laid, which is a conductor of sound. Mr. Clawson forms his filling in a plastic state, molding it in the place where it is to be used, and then entirely removing the molds.

EYEGLASSES.—Chas. Slotterbek, Lakeport, Lake Co. No. 311,615. Dated Feb. 3, 1885. This improvement consists of a perforated opaque diapbragm, which is substituted for a small section of citber lens of an ordinary spectacle or eyeglass. The invention is specially useful as an aid to persons whose sight has become defective, and acts as a collimator in enabling them to take sight eitber in sbooting a gun or in the use of surveying instruments, or for other similar purposes. It cuts off all diffused light, rnd permits only a direct ray to enter, thus enabling the operator to draw an accurate line of collimation through the sights of an orginary rifle, even though he may suffer from the defective convexity of the eye. It leaves tbe view unimpeded when its use is not necessary, so tbat a person using glasses will use them in the ordinary manner witbout any interference by the opaque portion.

VALVE GEAR FOR HIGH SPEED WATER-WHEELS.—Isaac Lepley, Amador Ci y, Amador county. No. 311,591. Dated Feb. 3, 1885. This invention relates to a mecbanism for opening and closing valves in tbe supply-pipes of water wheels which are driven by the momentum of a column of water under a high head; and it consists of a plunger conneated with the water-gate stem, and baving its ends fitted to work in two cylinders placed opposite to each other; pipes leading to them from a supply-valve cbamber to furnisb wates, by which tbe plunger is moved to open or close the gate, and a single lever operating between disks upon a shaft; and having panels and rods so arranged that either disk may be turned and its connecting mechanism operated to open its gate and drive the wheel in either direction. Certain details of construction are also covered by the patent.

AUTOMATIC ALARM FOR RAILROAD CROSSINGS.—Jno. T. Pritchard, Carson, Nev. No. 311,607. Dated Feb. 3, 1885. This is a device for giving a signal or alarm from the train, whenever a crossing is approacbed, or at any otber desired time, and it consists of a mecbanism connected with the bell and whistle of tbc locomotive, by whicb tbey may be sounded, and a means for operating tbis mecbanism at auy desired point. The mecbanism is operated from tbe road-bed, by light supplemental wheels, under the pilot, coming in contact witb a central rail or timber, tbese wbeels operating suitable levers connected with the wbistle and bell. Tho device is quite simplo in operation.

Inventors and Patentsss

Are referred to the notice of L. Peterson in our advertising columns. He has for ten years been successfully engaged in making models and otherwise assisting inventors, patentees, and others in completing inventions, new mechanical designs, machinery, etc. Write to him for any further information.

Market Reports.

Lumbar at Wholesals.

There is a fair demand for lumber, but no special changes in price. Quotations of cargo rates are as follows for redwood lumber, for delivery at San Francisco, Oakland, Alameda, Berkeley, Vallejo, Benicia, Port Costa, Martinez and Antioch:

ROUGH.—No. 1 rough merchantable, $18; No. 2 (refuse) rough, $14; No. 1 rough boards (specified width, 10 inches and over), $19; No. 2 (refuse) do do do, $14; No. 1 rough lumber, surface one side, $21; No. 2 (refuse) do do do $15.

PICKETS.—Rough square pickets, $12; rough pointed do, $14; fancy pointed do, $22.

HALF-INCH LUMBER.—No. 1 ½-inch surfaced, board measure, $40; No. 2 do do do, $39; No. 3 do do do, $38; No. 4 (refuse) do do do, $32; No. 1 ½-inch battens, board measure, $40; No. 2 (refuse) do do do, $32; No. 1 ½-inch siding, 12 ft. and over, but, $40; No. 2 (refuse) do do do $32; ½-inch siding, under 12 ft, $32.

RUSTIC.—No. 1 Rustic, 1x10, 12 ft and over, $33; No. 2 do do do, $32; No. 3 do do do, $31; No. 4 Rustic, 1x10, $28; No. 5 (refuse) do do do, $21; No. 1 Rustic, 1x8, 12 ft and over, $31; No. 2 do do do, $30; No. 3 do do do, $29; No. 1 Rustic, 1x8, $26; No. 5 refuse) do do, $21.

CLEAR.—No. 1 surfaced and rough clear, $32; No. 2 do do do, $31; No. 3 do do do, $30; No. 4 (refuse) do do do, $24; No. 1 surfaced and rough clear, 1x8 and 1x6, $30; No. 2 do do do, $29; No. 3 do do do, $28; No. 4 (refuse) do do do, $24.

[Dimensioned, Surfaced and Rough Clear (widths and lengths), 12 inches wide and over, add $1 ₱ M (on each corresponding grade) to the above list price of "Clear."]

TONGUED AND GROOVED.—No. 1 T and G, 1x4, 12 feet and over, $32; No. 2 (refuse) do do do, $24; No. 1 T and G, 1x6, 12 ft and over, $30; No. 2 (refuse) do do do, $24; T and G, 1x6, 7 to 11 ft, $26; do do, under 7 ft, $23.

TONGUED, GROOVED AND BEADED.—No. 1 T, G and Beaded, 1x4, 1¼x4 and 1¼x6, 12 ft and over, $32; No. 2 (refuse) do do do, $24; T, G and Beaded, 1x4, 1¼x4 and ¼x6, 7 to 11 ft, $27; do do, under 7 ft, $22.

ROUGH CLEAR.—1x6 and under in width, and under 12 ft in length, $24.

[On a credit of 60 days, or a discount at the rate of 1 per cent per month for antici ated payments, and not less than 1 per cent per month added for extension of the same].

We quote cargo rates—Pine—Merchantable Rough, $15 ₱ M; Flooring, $24.20; Stepping, $37 ₱ M; Redwood—Merchantable Rough, $18; Surfaced, $32; Rough Clear, $32; Rustic, $33; Tongued and Grooved, $30; Tongued, Grooved and Beaded, $32.

Lumbsr at Rstall.

Retail quotations for pine, fir and spruce are as follows:

ROUGH MERCHANTABLE.—(Ordinary sizes) to 40 feet long, per M ft, $22.50; Rough Merchantable, 1x6, Fencing, $22.50; do do, 1x4, do, $23.50; do do, 1x3, do, $24.50; do do, 1x4, odd lengths, $22.50; do do, 1x6, do $21.50; do No. 2, all sizes, $18.50; do Selected, $26.50; do Clear, other than for T and G and Stepping, $31.

[Rough Clear for T and G and Stepping $1 ₱ M less than price of kind for which intended.]

Dressed T and G Flooring, 1x6, No. 1, vertical grain, ₱ M ft, $33.50; Dressed T and G Flooring, 1x6, No. 1, $33.50; do do do, No. 2, $28.50; Dressed T and G Flooring, 1x3, 1x4, 1¼x4 and over, No. 1, vertical grain, $40.50; do do do, No. 1, $35.50; do do do, No. 2, $29.50; Dressed Stepping, No. 1, vertical grain, $42.50; do do, No. 1, $37.50; do do, No. 2, $28.50.

SPRUCE—Rough Merchantable, ₱ M ft, $21.50; do Clear, $35; Clear Dressed (shelving), $40; Pickets (rough) board measure, $20.50; Furring, 1x2, per lineal ft, 1c; Laths, 1 and 1-¼inch, ₱ M, $3.50; 1½-inch, $4.

[N. B.—For all sizes over 14 inches, and lengths over 40 feet, extra rates].

Retail quotations of Redwood are as follows:

ROUGH MERCHANTABLE—₱ M ft, $22.50; do Selected, $27.50; do No. 2, $18.50; Surface, No. 1 and Rough Clear, $40; do, 1x6, $37.50; do, No. 2, $30; Rustic, No. 1, 1x8, $37.50; do, No. 1, 1x10, $40; do, No. 2, $35; do, under 10 ft, $35; T and G Redwood, 1x4, 1¼x4 and 1¼x6, $40; do do, 6 inch, 12 ft and over, $37.50; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; do do do, No. 2, $30; do do, Beaded, 12 ft and over, $40; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; Half inch Surface, $22.50; Pickets, Fancy, $30; do, Rough, pointed, $20; do do, square, $17.50; Siding, ½-inch, $27.50; Battens, ½-inch, per lineal ft, 1c; Shingles, ₱ M, $2.50; Shakes, Split, $11; do, Sawed, $12; Posts, per piece, 13c; Dressed Boards, ₱ M ft, $25.

On a credit of 60 days or less, or a discount of two (2) per cent for cash only. On all credits exceeding 60 days' time, not less than one (1) per cent per month to be added.

Under the rules of the Exchange, no "lump" sum will be given on any bill of lumber.

Nails.

We give the price list of the Pacific Iron and Nail Company:

FENCE AND BRAD.—10d to 00d, $2.90: 8d and 9d, $3.0?; 6d and 7d, $3.25 4d and 5d, $3.50; 3d, $4.25; 2d, $5.50.

BARRELS.—¾ inch, $6.75; ⅞ inch, $5.75; 1 inch, $5.25; 1½ inch, $4.50; 1¾ inch, $4.25; 1⅞ inch, $3.75; 1½ inch, $3.50.

LINING.—¾ inch, $7.25; ⅞ inch, $8.75.

TOBACCO.—10d, $3.25 8d, $3.50; 6d to 7d, $3.75.

CLINCH.—6d to 30d, $4.50.

SLATING.—5d, $3.75; 4d, $3.75; 3d, $4.50; 2d, $6.75.

FINISHING.—2d, 1 inch, $3.75; 3d, 1¼ inch, $6.75; 4d, 1½ to 1¾ inch, $4.50; 6d, 2 inch, $4.25; 8d, 2½ inch, $4.00; 10d, inch and over, $3.75.

CASING AND BOX.—10d to 30d, $3.50; 8d, $3.75; 6d, $8.00; 4d, $4.25; 3d, $5.25.

FINE BRAD.—4d, $4.50; 3d, $5.75; 2d, $6.50.

CUT SPIKES.—All sizes, $3.00.

BOAT SPIKES.—All sizes, $3.50.

Each half keg 10 cents extra.

TERMS.—Note or acceptance at 60 days with current rate of Exchange on S. F., or a discount of 2 per cent for cash, if remitted within 10 days from date of invoice.

All accounts when due subject to sight draft without notice.

An abatement of 10 cents per keg will be allowed upon orders of 200 kegs or over.

Building Material.

Lime, per barrel, $1.50@$1.60. Plaster, $2.75-3.00. Eastern Plaster, $3.00-3.25. Rosendale Cement, $2.25-2.75. Portland Cement, $3.50-3.75. Fire Brick, per 1,000, $40 @ $45, according to brand; hard, $10.00@$12,00; red, $8.00@$8.50; soft, $7.50; face, $30.00.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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Mrs. ORIER—Humboldt County.
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DESCRIPTION OF PLATES:

Estimated Cost Complete.

PLATE 1.—Modern House of 8 rooms and laundry in basement, elegant and spacious staircase, hard wood mantels, brick foundation, electric bells and speaking tubes, modern improvements.....$4,500

PLATE 2.—One story and three-quarter Picturesque Cottage, with observatory, suitable for elevated lot, 14 rooms..... 5,500

PLATE 3.—Picturesque Cottage of 7 rooms and bath 3,750

PLATE 4.—Residence now building at 16th and Union Sts, Oakland, Alameda Co., Cal. (S. Davisson, Esq., owner)..... 3,500

PLATE 5.—City Residence of 9 rooms, Queen Anne style..... 5,000

PLATE 6.—Residence, 9 rooms and bath, built on Capp and 22d Sts., San Francisco. (C. Evans, owner)..... 4,500

PLATE 7.—City Residence of 8 rooms and bath..... 3,800

PLATE 8.—Hardwood Mantels, with tile hearths and facings, suitable for dining and sitting rooms and parlors..... ——

PLATE 9.—Cottage of 6 rooms and bath room, wooden mantels..... 3,000

PLATE 10.—Plans and Elevation of a 4-room and bath cottage..... 950

Plan and Elevation of 3-room Cottage, bath in kitchen..... 700

PLATE 11.—Residence 11 rooms, picturesque..... 8,000

PLATE 12.—Dwelling of 7 rooms, laundry and bath room, now building at Eureka, Humboldt Co., Cal. 3,500

PLATE 13.—Plans, Elevations and Details of a Cottage of 5 rooms, observatory and bath; laundry and wood and coal room in basement; brick foundation; cathedral glass, etc..... 2,750

PLATE 14.—Residence built at Eureka, Humboldt Co., Cal. (D. A. Boyd, owner)..... 3,000

PLATE 15.—Large Picturesque Country Residence, 10 rooms, large hall, panelled in hard wood, cathedral glass, etc..... 12,000

PLATE 16.—Residence of 9 rooms, built on Broadway and Buchanan Sts. (O. Helmrich, Esq., owner)..... 6,000

PLATE 17.—Swiss Combination Dwelling of 7 rooms and bath..... 3,750

PLATE 18.—Summer Residence, 5 rooms and bath, built at Santa Rosa, Sonoma Co., Cal..... 4,500

PLATE 19.—Cottage of 6 rooms, in the Modernized Queen Anne style, recently built in Centerville, Alameda Co., Cal. (C. A. Plummer, owner)..... 2,700

PLATE 20.—Residence of 6 rooms and bath, laundry, electric bells, mantels, etc., Filbert and 15th Sts.; also, on Market St., near 8th, Oakland, Cal. (J. C. Newsom, owner)..... 2,400

PLATE 21.—Residence of 9 rooms and bath, built on Peralta Heights, East Oakland, Cal. (Chas. Newton, Esq., owner)..... 4,000

PLATE 22.—One three-quarter story Residence of 6 rooms and bath room, built on Peralta Heights, East Oakland, Cal. (Wm. Price, Esq., owner)... 2,800

PLATE 23.—Cottage of 6 rooms and bath..... 1,800

PLATE 24.—One story and three-quarter Cottage, built on 6th ave. and East 14th St., East Oakland, Alameda Co., Cal. (J. W. Evans, Esq., owner); also, seven different stair details..... 4,000

PLATE 25.—Residence of 9 rooms and bath, built in Stockton, San Joaquin Co., Cal. (Wm. Swett, Esq., owner)..... 4,000

Also, seven different kinds of doors and inside finish.

PLATE 26.—Suburban Farm House of 7 rooms and bath, built on J. Lancaster's, Esq., farm, Los Gatos, Santa Clara Co., Cal..... 2,700

PLATE 27.—Residence of 6 rooms and bath, designed for Dr. H. Gardiner, Santa Clara, Cal..... 3,500

PLATE 28.—Dwelling of 7 rooms and laundry; built row of eight for Col. Samuel Wood; 9th St., bet. Brush and West Sts., Oakland. Alameda Co., Cal.; also, details of finish of same; also, of fence. Each house..... 2,600

PLATE 29.—1. Plan of Cottage of 5 rooms, laundry and bath room..... 1,900

2. Plan of Cottage of 6 rooms, laundry and bath room..... 2,000

3. Plan of Cottage of 5 rooms, laundry and bath room..... 1,750

PLATE 30.—Suburban Dwelling of 9 rooms, laundry and bath room, built in Santa Rosa. (T. J. Ludwig, owner)..... 3,750

Also, one and three-quarter story Cottage, with tower, 6 rooms and conservatory..... 3,000

PLATE 31.—Queen Anne Dwelling of 14 rooms and bath room, large hall and easy stairs, onyx mantels, cathedral glass, etc.; also, details of chimneys and inside finish..... 12,000

PLATE 32.—City Dwelling, 11 rooms, dressing rooms and bath room; also, saloon chambers; also, dining room mantel..... 15,000

PLATE 33.—Cottage of 6 rooms and 2 servants' rooms in attic, built on San Pablo avenue, Oakland, Cal..... 2,500

PLATE 34.—Residence designed for J. Rosenthal, Esq., to be built on Pierce and Hayes Sts., San Francisco. Onyx and hard wood mantels, tiled gables and cathedral glass, connecting bedrooms, baleonies, etc.; 10 rooms, laundry and bath..... 9,000

PLATE 35.—Residence of C. Hirshfeld, Esq., on north side of California, bet. Pierce and Scott, 10 rooms and bath..... 5,500

The Plans are clear, and finely drawn on Lithograph Plates, and handsomely printed; size, 9x13 inches.

Subscribers to this paper (old or new), who pay one year in advance of the date of application for this premium, can have the same by paying $1 additional. Sent by express, unpaid, or on receipt of $1.10 post paid.

Our Improvements.

The various departments of our somewhat extensive business have long been carried on in different localities. But we have lately adopted plans whereby we expect within a few weeks to bring all under one roof, at No. 252 Market street. To do this our editorial rooms, composing and press rooms, located at No. 414 Clay street since Aug. 8, 1868, will have to be removed. In preparation for this, an expensive excavation, extending below the water line, has been made under the sidewalk adjoining our frontage on Front street, in which our large steam press will be placed, and thereafter propelled by an eight horse-power gas engine. The same power will operate the machinery for stitching and trimming our paper and operating the elevator directly connecting our press, folding and mailing rooms with our composing, business and patent offices on the fourth floor.

The entire outlay by the proprietors of this office, in effecting these substantial improvements, will amount to several thousand dollars. It is believed that the consolidation of their business in more convenient, commodious and pleasant quarters will render their work more effective and prove a lasting benefit to their patrons generally, when fairly settled down again in all departments.

Here let us say, both cheerfully and hopefully, to our numerous and considerate patrons, that their prompt financial favors can hardly come at a better season to be appreciated. We hope that all who can will renew their expired and expiring subscriptions. And may we not add, also, try and influence many of their new and old neighbors to subscribe for the paper that is faithfully doing its very best for their interests and the welfare of the community throughout its field of labor? You can have the reasons mentioned, with the argument that we intend to issue an improved and more valuable publication than ever before.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased, and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete, and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent

ASSESSMENT NOTICE.

Fremont Mining and Milling Company.—Location of principal place of business, S n Francisco, Cal. Location of works, Amador county, near Drytown, Cal.

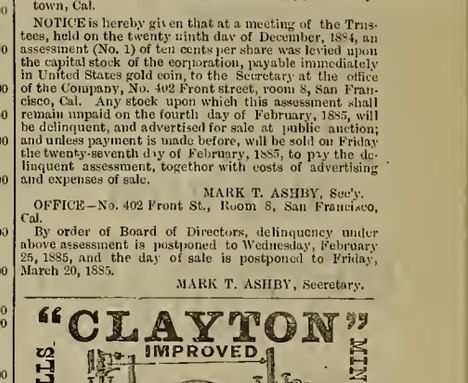
NOTICE is hereby given that at a meeting of the Trustees, held on the twenty ninth day of December, 1884, an assessment (No. 1) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, No. 402 Front street, room 8, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the fourth day of February, 1885, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday the twenty-seventh day of February, 1885, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

MARK T. ASHBY, Sec'y.

OFFICE—No. 402 Front St., Room 8, San Francisco, Cal.

By order of Board of Directors, delinquency under above assessment is postponed to Wednesday, February 25, 1885, and the day of sale is postponed to Friday, March 20, 1885.

MARK T. ASHBY, Secretary.



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BOUND VOLUME OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future reference and library use.

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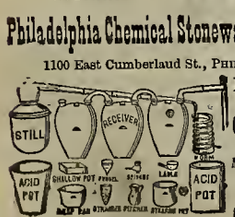

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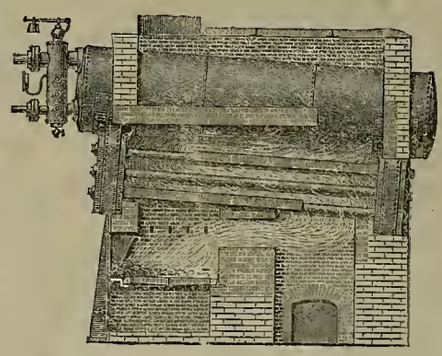

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Risdon Iron and Locomotive Works—Gentlemen: We have had one of your Heine Patent Safety Boilers in use for four months at our Borax Works, in Alameda. It does good work and gives perfect satisfaction. Yours truly,
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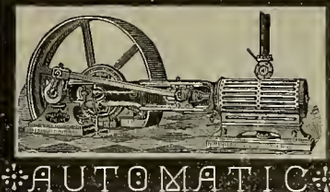

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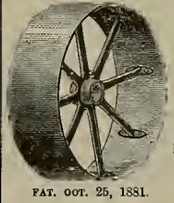

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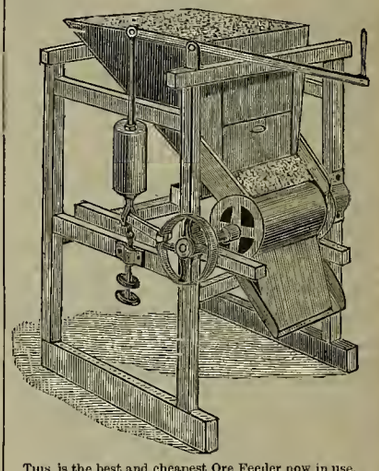
[Patented May 28, 1882.]



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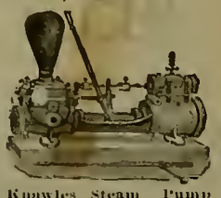

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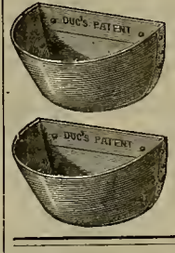

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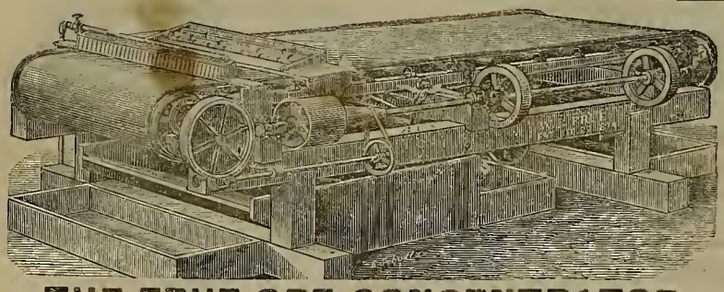

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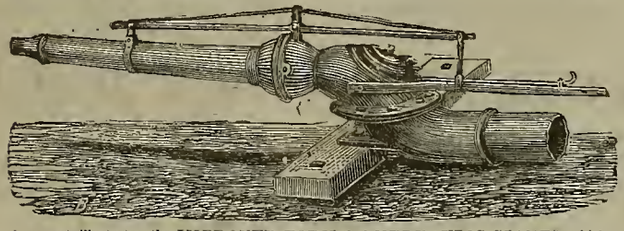

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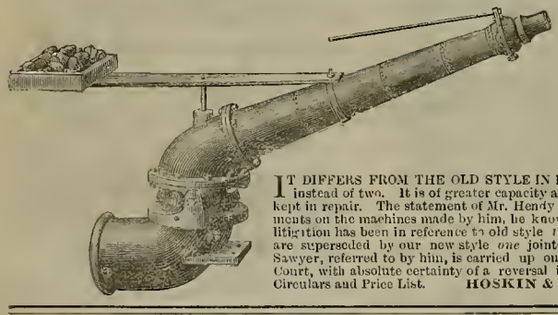

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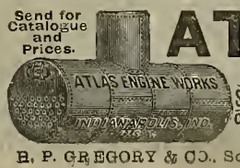

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MINING AND SCIENTIFIC PRESS.

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Taylor's New Rock Crusher.

Mr. H. R. Taylor, of this city, has invented a new form of rock-crusher which he calls the "Patent Rock Fine Crusher" for assayers' samples, working specimen ores, crushing old crucibles, etc. The design of this small machine is to enable a person quickly and easily to bring to fine powder the hardest ores, to be assayed, sampled or worked. The machine is represented in the engravings, Fig. 1 showing a general view of the apparatus, and Fig. 2 the lever, toggles, etc.

Both jaws are faced with hard, white iron, the lower parts of which are plain surfaces, between which the ore is crushed fine. The stationary jaw B has its lower plain surface at an angle to the upper or corrugated surface. The lower part of this jaw is adjusted by screws, to crush fine or coarse. The movable jaw C is operated by the hand lever A, jaws, links and toggles, as shown at Fig. 2. The jaw C has its corrugations horizontal to facilitate the forcing the ore down at each stroke of the lever. This jaw has a vertical and a horizontal motion, the link E forcing the plain part of jaw C forward with great force, at each downward stroke.

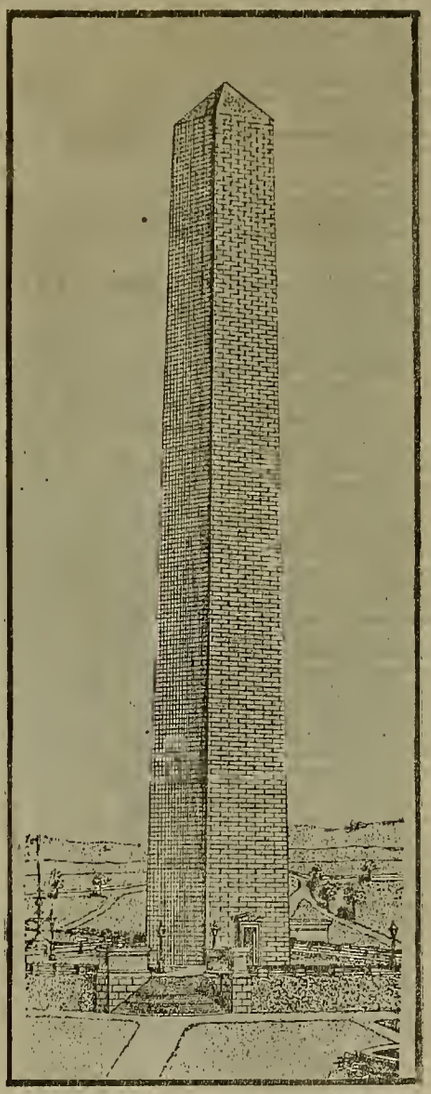
The whole can be quickly taken apart for cleaning, after each lot is worked. To do this, raise the lever A as in Fig. 2, and with the tapering drift drive out pin G (upon which lever A turns), then the lever can be thrown over, and jaw B removed, and all dusted clean with the brush. To restore the parts to position again, replace the jaw B, bring back the lever and insert the pointed drift, and with the pin or fulcrum G drive out the drift, and all is ready and clean for the next crushing.

The lever has a rubber covering where grasped by the hand, and a rubber cushion where it strikes the bed-piece, to prevent jar and noise. There is a star-shaped piece on top of the lever (not shown), by the turning of which the hight to which the lever can be raised is regulated; and when the lever is raised as in Fig. 2, this star-shaped piece is turned half around.

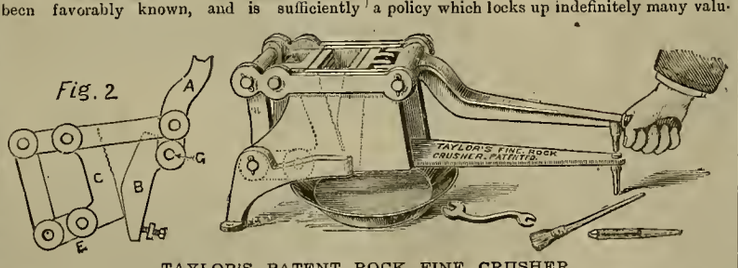
Each machine has a cover (not shown) to prevent pieces of ore from flying out, and is furnished with a wrench, drift-pin and dust-brush. It weighs complete 85 pounds and costs $25. The engraving shows the hand size, but larger crushers, to be used by power, can be made on the same plan. The device is really practical and useful, and accomplishes work easily and with great rapidity. John Taylor & Co., dealers in assayers' materials, mine and mill supplies, 112 to 120 Pine street, in this city, have them for sale. For prospectors' purposes, working specimen ores, and crushing small batches of rock they are excellent. The ore is crushed very fine indeed and with little expenditure of power, the system of toggles, etc., giving great leverage. Although just introduced on the market the crushers are meeting with very ready sale.

The strangest thing in connection with the silver question is that many of the Eastern capitalists who favor the suspension of silver coinage and a reduction of the tariff on lead are heavy owners of Western railway stocks. Cripple the silver and lead interests of the country, and where is there a railroad west of the Rocky mountains that would pay its running expenses?

The Grizzly Quartz Mine.—We understand that the Grizzly lode, which adjoins the famous Alaska mine of Sierra county, is offered for sale, but at a figure we can hardly believe to be correctly stated, as the mine has long been favorably known, and is sufficiently opened by shaft and tunnel to prove its character and value. It is to be regretted that the owner, formerly of Sierra, is debarred by business elsewhere from actively exploiting a lode which—if some of our quartz experts misjudge not—is likely to prove as rich a gold repository as the Alaska, the Four Hills or the Rainbow. The Grizzly is in charge of Mr. Thomas Phillips, of Pike City, and the work thereupon is restricted to the required annual expenditure, a policy which locks up indefinitely many valuable mines. We trust all such properties now held by parties unwilling or unable to fully work them may speedily pass into more enterprising hands, and thereby add additional wealth to the locality where they are situated.



THE WASHINGTON NATIONAL MONUMENT.—(See page 125.)



TAYLOR'S PATENT ROCK FINE CRUSHER.

Lucine District.

We had a conversation a few days since with a miner from Lucine District, on the borders of Nevada and Utah. The most of the mines are in Box Elder county, Utah, about six miles south from Tacoma Station, C. P. R. R. The district was discovered in 1868. After the first boom not much work has been done until recently. A number of men have gone to work there of late opening claims, and have been shipping ore to the Salt Lake market. The ore is silver-lead, running from 25 to 65 ounces of silver and 25 to 50 per cent of lead.

The place was originally opened as a copper camp years ago, and the surface indications were very good indeed. The copper ledges are very large, some of them being from 100 to 150 feet wide. While the old Tacoma mine was running there was great interest in the camp, and some 10,000 tons of ore were shipped. This mine belongs to New York owners and is not now worked. Recently some Salt Lake capitalists have come into the camp, and will in the spring open it up. Some of the copper properties have been purchased by them. The ore has to be hauled by teams to the railroad, and then shipped to the smelters at Salt Lake for reduction. Ore is now sent that way, sampled, and sold to the highest bidder. The gangue in which the mineral is found carries a good percentage of iron, which makes the ores flux easily, and the ore brings good prices in consequence at the smelters. Quite a number of men intend going to the camp in the spring to open up and work the mines. Part of the claims are in the State of Nevada and part in Utah Territory.

California Minerals for New Orleans.

As stated in last week's Press, a portion of the money given by the Legislature towards securing a good representation of California products at the New Orleans Exposition will be expended in displaying a mineral collection. The State has an extensive collection at the State Mining Bureau, but there were some legal objections to its removal until the Legislature adopted a concurrent resolution by which the State Mineralogist is "authorized and directed" to select from the collections in his charge such specimens as in his judgment will best represent the mineral wealth of the State and take them to New Orleans, there to be exhibited for as long a time as he may see fit.

Having this permission, Mr. Hanks, State Mineralogist, is selecting and packing a collection of specimens for shipment, and on or about the 1st of March will leave for New Orleans with the minerals. It is unfortunate that the Bureau has no fine gold ore specimens, the best of them having been stolen some time since. The Mineralogist has, however, written to the leading mines, asking for about 200 pounds of ordinary working ore. These specimens will be forwarded direct to New Orleans, and will form a very characteristic feature of the Exposition. These specimens of low-grade ore will be presented to Louisiana to form a part of the permanent exhibition in the Exposition buildings. The Mining Bureau will remain open as usual while the Mineralogist is absent.

The location of a claim should be followed at once by recording it. This often saves trouble.

CORRESPONDENCE.

We admit, uneudorsed, opinions of correspondents.—EDS

Trinity County Mines.

EDITORS PRESS:—I thought possihly you might like to hear of the mining outlook around here. The McDonald mine is yielding the usual amount of ore and the stopes never looked hetter. All the other mines are in the same condition. I need not mention them in detail as I have deecribed them already through your columns. A rich strike has recently heen made here hy Mr. Myres, who has heen working driving tunnels through his claim for the past five years. He has struck a rich ledge which averages four feet in width, and when worked at the mill yielded $150 per ton. It is in French Gulch mining district, on the south fork and in the same range as the Shafter mine, which was recently hought by William T. Coleman & Co. So much for this district. I have received several communications of late from my hrother miners in Nevada and Arizona asking me what I thought ahout New River, and as your journal has a wide-spread circulation among the mining element, on account of the bold standpoint it has taken in regard to legitimate mining, I thought I would give them my opinion of it through the PRESS. In reply to them I will state that I have not heen there, hut a friend of mine who is a thorough, practical miner went there to examine it closely. His statement in regard to it is this (which I know to be true): There are a few small lodges discovered, which would work about $30 per ton, and the miners instead of developiog them ask fabuloue prices for their find.

There are also miners coming hack from there every day and staying at our camp who verify the above statement—meu whom I know to he trustworthy. So I would warn all miners who want to come to New River in quest of employment to stay away from there, as there are only five men working for wages in the camp just now. This does not apply hy any means to prospectors, as I know enough ahout the country to state that there is an immense range of country to prospect along the north fork, and no doubt good mines will be discovered there, for aloog its streams it yielded placer gold in ahundance, and just the right formatiou to find minee in porphyry and slate. Your correspondent mentions these matters to show up things in their true light; not helieving in perpetrating a gross fraud upon a crowd of miners, gotten up by railroad and steamhoat companies and a few saloon-keepers and hotel men along the route who are like Dickens' Micawber, "waiting for something to turn up." Also another class who are a pest to this country are the would-he experts who come around miners, say they are representing capital, and are simply a nuisance; who claim they were educated iu Frieburg and speak very had English. I would advise all miners to keep away from them, for nearly all of them don't know a piece of quartz from a grindstone.

In conclusion, I again tell the miners who are looking for work not to come here, as there is an overplus of miners in this county already.

P. F. MCCARTHY.

Deadwood, Trinity Co., Cal.

THE PIONEER MINE SUIT.—A long and elahorate decision has been rendered hy Judges Sawyer and Sabin in the case of the Pioneer Gold Mining Company vs. Benjamin F. Baker. The suit was hrought in 1883 in the Superior Court of Sierra county to establish a right to redeem the Pioneer mine, situated in that county, under an alleged mortgage said to have heen created aud effected hy virtue of certain contracts and sales. Baker was the origioal owner of the mine, and sold the same to the plaintiffs in consideration of $112,500 cash, and the remainder, making up the whole amount, $255,000, was to he paid from the profits of the mine. These notes formed the alleged mortgage, hut as the mine failed to "pan out" as well as expected they were unpaid, and Baker, who acted as Superintendent, took it upon himself to hold possession of the mine. This caused the action at law. In the decision, which is an interlocutory one, the right of the plaiutiffs to the mine is upheld, and their right to work the same conceded. It was therefore ordered that a preliminary decree he entered in favor of plaintiffs, and the case he referred to the standing master in chancery of the Court hetween the parties and report the same to the Court.

STILL REMAINING.—There appears to be a let-up in the exodus from the Comstock. The passenger traffic on the Virginia and Truckee Railroad for the last month has heen very light, and hut very few people have left here, which shows that confidence is revived in the men who a few months ago thought the Comstock was played out. It will he a long time hefore the Comstock reaches bed-rock, although at present times are a little dull —*Virginia Enterprise.*

A DISPATCH from Daggett, San Bernardiuo county, says: Messrs. Waterman & Porter, of the Waterman mines, have purchased a one-half interest in the Sue mine, and will commence the erection of a 15-stamp mill at that place. The combination is to he known as the Sue Mill and Mining Company.

Determination of Phosphorus.

Josef Westesson, chemist of the Chester Rolling Mills, Thurlow, Pa., read hefore the American Institute of Mining Engineers at a recent meeting the following paper:

No question in the metallurgical chemistry of the present day seems to he so difficult to agree upon as the determination of phosphorus in iron and eteel. To my knowledge, there are at present at least three different methods in use in the iron lahoratories of the United States, viz.: The citric acid method, the molyhdate-magnesia method, and the direct molybdate method—the last named method having heen lately adopted. Each of these methods has its advocates, who take every pains to prove its advantages and the incorrectness of the others; and much has heen written for the purpose of securing the use of a standard method, as yet, however without any result.

There is no douht, or ought to he none, that each of these methods gives correct results when it is carefully conducted and every precaution taken. But it is not only correct results that we want uowadays. The demand is great, also, for getting results in the shortest possible time. I think it has heen sufficiently proved that the direct molyhdate method, the weighing of the precipitate, answers well in both respects. Being a pupil of Prof. Eggertz, I have myself used his method for years until quite recently, as it is described by Mr. Troilius in our "Transactions," Vol. X, p. 166 (hut with some slight modifications), and I can safely say that the results of this method agree well with those of the molybdate-magnesia method. I have, moreover, heen checked in a few instances by some of the leading chemists of the country, and their results have been such as to commend the method I use.

On the European continent, and also in England, the molybdate method is almost exclusively in use. Therefore, the question is there not so much ahout the superiority of different methods; researches and experiments tend more to improve the method generally adopted. An important step in this direction has been taken hy Dr. Adolph Tamm, of Stockholm, Sweden, whose paper on the subject is puhlished in the *Jernkontorets Annaler* of 1883, under the title, "Concerning Different Ways of Dissolving Iron for the Determination of Phosphorus hy Means of Ammonia-Molyhdate." The principal contents of this paper are suhstantially given helow.

When iron is dissolved in nitric acid the solution acquires a brownish- color from humic acids, originating from the carbon in the iron. These humic acids are not destroyed hy evaporating the solution to dryness at 212°, or on a water-bath, hut continue to give the brownish color after redissolviug iu nitric acid. The color would, of course, be of uo consequence if experiments had not shown that the humic acids, tbe presence of which it indicates, prevent the complete precipitation of phosphorus. That such is the case seems to he clearly proved by the facts that the silica and graphite, filtered off from the solution, show no presence of phosphorus; that the filtrate, after a new addition of molyhdate and boiling, remains perfectly clear; and finally, that the method which Dr. Tamm recommends gives considerably higher results. This method, which he has worked with great satisfaction, and the correctness of which he has confirmed by the magnesia method, is the following:

Dissolve 1 gramme of iron in 12 c.c. of nitric acid (1.2 sp. gr.), and hoil on a cast-iron plate down to dryness. Let the beaker remain on the hottest part of the plate—usually at least 200° C.—an hour. Redissolve in strong hydrochloric acid, hoil down again to dryness, and let the heaker remain another hour on the hottest place—the second evaporation to dryness for complete separation of silica. Again dissolve in strong hydrochloric acid aud remove the excess of acid through evaporation; add 5 c.c. of water, filter, and add the ammonia-molyhdate.

The following table, given hy Dr. Tamm, will show the results of hoth methods. It is to he observed that the higher the amount of phosphorus in an iron, the greater the difference in the results. The old method is marked B, the new method A:

	Per cent of phosphorus according to	
	A	B
Pig-iron	.019	.013
Pig-iron	.021	.016
Wrought-iron	.023	.015
Pig-iron	.024	.015
Pig-iron	.024	.016
Pig-iron	.024	.016
Bessemer steel	.026	.018
Pig-iron	.026	.015
Pig-iron	.026	.017
Pig-iron	.027	.020
Bessemer steel	.027	.019
Bessemer steel	.027	.019
Bessemer steel	.028	.018
Bessemer steel	.028	.019
Pig-iron	.029	.019
Bessemer steel	.030	.020
Pig-iron	.065	.045
Pig-iron	.077	.053
Pig-iron	.078	.055
Wrought-iron	.109	.080
Pig-iron	.212	.135
Pig-iron	.222	.141
Iron rail	.391	.353
Pig-iron	.410	.260
Iron rail	.541	.433

That the results obtained by the molyhdate method, as it is generally worked, should, according to Dr. Tamm's revelations, be inaccurate to so great an extent, is a very discouraging fact; and the only thing that can console the practitioners of that method is, that the molyhdate-magnesia chemists are making the same errors. There are chemists whom I havs made acquainted with Dr. Tamm'e method who helieve etill less in this method than the old one, and, I dare say, it will he some time hefore they become convinced. The frequent remark that the yellow precipitate is soluhle in hydrochloric acid will, in this case, he hest disposed of hy the words of Fresenius: "The presence of molyhdate of ammonia alters the precipitate's deportment to acids; *only large excess of hydrochloric acid prevents complete precipitation.*" Therefore, the excese of said acid must he removed hefore adding molyhdate. Some hold that the orthophosphoric acid is transformed into pyrophosphoric acid through heating to 200° C. This is true, hut they forget that hoiling the dried mass in hydrochloric acid hrings the pyrophosphoric acid hack into the orthophosphoric state. Taken altogether, the objections do not hold good, even if we admit that a trace of molybdic acid eometimes is precipitated along with the yellow precipitate, which, of course, will uot have any influence on the final result, this being only 1.63 per cent of the precipitate. A very essential advantage of this method is, that results can be obtaiued in less than five hours.

I give helow a table of results ohtained hy myself in the use of both methods. A and B mean the same as in Dr. T.'s tahle. The precipitates ohtained in method A have heen redissolved and precipitated with manganese solution:

	Per cent of phosphorus according to	
	A	B
Pig-iron	.030	.802
Pig-iron	1.030	.945
Pig-iron	.715	.674
Pig-iron	.412	.371
Pig-iron	.447	.447
Pig-iron	.250	.230
Pig-iron	.082	.073
Pig-iron	.040	.821
Pig-iron	.092	.055
Pig-iron	.068	.053
Plate steel	.068	.064
Plate steel	.081	.075
Plate steel	.082	.072
Plate steel	.059	.068

Notes on the Patio Process.

The followiog paper was read before the American Institute of Mining Engineers, by C. A. Stetefeldt, New York City: The *hacienda* Sauceda is one of the largest and finest *haciendas* in the vicinity of the City of Zacatecas, Mexico, and is said to reduce ores by the Patio procees more cheaply than any other establishment. It receivcs its supply of ore from the San Acacio miue. This mine has heen for some time, like most of the Zacatecas mines, out of bonanza, and yields, at present, ore of rather low grade. The silver occurs principally as silver-glance, ruby-silver and native silver, associated with pyrites of iron and copper, and some galena and zinc-hlende, io a gangue of pure quartz, which takes the form of amythyst whenever the ore is of high grade. All the ore, as it comes from the mine, is broken hy hand into small pieces, and sorted hefore it is delivered to the *hacienda*. Here it is firet crushed dry in Chili mills, and then ground wet in arrastras to an impalpable powder. The sulphurets not decomposed in the patio process are separated in the settlers from the tailings and concentrated by hand. By roasting them in a reverberatory furnace with carbonate copper-ores, "magistral" is obtained. All machinery is driven hy mule-power.

In the year 1883, the *hacienda* Sauceda reduced 17.726 tons of ore. The average value of the ore was 17.11 oz. silver per ton. Of this, 4.37 oz. or 25.5 per cent were lost. The loss in quicksilver was 1 pound per 7.4 oz. silver extracted. The total expenses of reduction were $8.12, Mexican money, per ton of ore distributed as follows, viz:

Pulverizing in Chili mills	$1.03
Grinding in arrastras	2.06
Salt, from 5 to 6 per cent	1.13
Magistral	0 80
Quicksilver, 1.71 pounds	0.90
Other items and general expenses	2.14
Total	$8.12

In considering these results by themselves, as far as the percentage of silver extracted is concerned, one would get an entirely wrong view regarding the perfec ion of the patio process. It seems that the loss in silver is a more or less constaot quantity per ton of ore; *i. e.* it is about the same for poor and for rich ores, whereby the percentage of silver extracted from the latter becomes remarkahly high. The following statistics, taken from the hooks, will illustrate this.

Assay-value of ore. Oz. silver per ton.	Percentage of silver lost.
32.22	10.0 per cent.
37.00	10.0 " "
42.60	6.1 " "
47.60	5.6 " "
99.60	7.0 " "

These figures are rather a disappointment to those who helieve that they can improve the reduction of certain ores in Mexico hy the introduction of modern methods. Of course there are many ores that will not yield a high percentage of silver in the patio process.

The same is to he said about the cost of reduction. Modern methods mean the replacing of mule-power by steam-power. In districts void of fuel, like Zacatecas, this is a serioue question. So far, the Mexican Central R. R. has not estahlished freight rates sufficiently low to permit the importation of coal, and it would he a risky undertaking for any mining company to rely upon a temporary concession as long as there is no competition. On the other hand, the cost of the patio process depends largely upon the price of corn. When, in dry years, the crops fail, the price of corn may be four times as high as in normal years. The estimates ahove are hased upon normal prices of corn.

The Famous Allison Ranch Mine.

There was some talk a few months ago, says the Foothill *Tidings*, ahout the Allison Ranch mine being again worked. That the paying ledge, within the houndaries of that mine, has not been exhausted is the general opinion of all who know anything ahout mining and about the Allisou Ranch mine. This tact that the ledge has only heen "just a little prospected" insures that the old ranch will again he worked, hut that event may be distant in the future, as the present owners are very wealthy and have no pressing and present need of the gold in the Allison Ranch ground. A short sketch of the start of the mine may not he out of place in these columns.

The Allison Ranch mine is located down Wolf creek, ahout two and a half or three miles below Grass Valley. It takes ite name from a man named Allison, who used to raise cahbages, meions and other garden truck just over the ledge, and from which ledge over $3,000,000 worth of gold has heen taken. No douht Mr. Allison, in his garden days, could and would have conscientiously eworn that his ranch was much more valuahle for agricultural than for mining purposes. The ranch will grow cahhages and fruit trees of all kiuds at this day, and there is still gold to millions of value at a few hundred feet in depth.

In 1852 John and William Daniels, with a company of four others (all Missourians), worked iu Wolf creek at Allison ranch, and with long toms and cradles were gettiog out the gold from the gravel of the creek bed. The four Missourians, who were the partners of the Daniels brothers, became tired and went hack to their old home, and their names are not known in this part of the couutry. In 1853, while digging a tail race, the famous Allisou Ranch ledge was struck, but no particular attention was paid to the find. The miners were hunting gold in gravel and did not care much for quartz.

In July, 1854, Michael Colbert and James Stanton bought into the creek claims, which were paying reasouably well. In that year William Daniels sold his interest, one-sixth, to James O'Donahue, getting for the interest the sum of $250. Soon after this transaction, the quartz ledge was again struck by the gravel minere while working near the upper end of the claim. At this point the gravel was very rich, but the fact excited no suspicion that the quartz ledge had anything to do with the richness of the gravel. Miners know more in these later days.

One day, in the fall of 1854, two of the partners, Colbert & Stanton, traced the ledge a short distance down the creek, hut they soon lost sight of it, and all the partners stopped for the day, excepting the two named. These took out ahout a ton of quartz in an afternoon, after the others had quit work. During the night there was a cave of their little pit, which covered the ledge and some of the quartz that had heen taken out. Wheu the winter's rains came and cleaned out the slickens io the creek, the quartz was uncovered and a ton and a half of it was taken out and takeu to Lee & Simpson's mill, a mile below the ranch, and there crushed, and the yield was about $375, although some say $600 was realized.

Experienced quartz miners of that day said that the ledge could not he profitably worked, because the expense of draioing would be so great. But Con Riley, then, as now, one of the hest miners on the coast, said the mine could he worked, and his advice was taken. Allison Ranch became famous throughout the world. We believe there is no man who can tell how much the mine has yielded, but the amount is above $3,000,000.

The cause that almost prevented the ledge from heing worked in the first place, now stands in the way of reopening the Allison Ranch mine, namely, the peculiarity of location as to drainage. But machinery for draining purposes is much more complete now, and much cheaper than in the days of the first working of this mine. And a comparatively very emall portion of the ledge of Allison Ranch mine has been taken out and milled. With the mill processes now in use, the saving the gold would very greatly exceed that of the days of the other workings.

W. H. PATTON, general manager of the operations in the mines controlled hy Messrs. Flood and Mackay at the Quijotoa, is on his way from Arizona to Pittsburg, Pennsylvania, to close a coutract for the iron pipe necessary to bring water to the new mill site at the mines. It seems as if these people, who made their money on this Coast, ought to spend it here, too. The San Francisco foundries make as good iron pipe as is made any where in the world, making a specialty of it and having special machiuery. The pipe ought to have been purchased here.

MECHANICAL PROGRESS.

Growth of American Iron Industries.

There is every reason to believe that this country would have taken a prominent part in iron production at an early period of its history had the development of the business not been obstructed by British policy. More than 200 years ago iron had been smelted in Maryland and Massachusetts, but the British rulers put so many restrictions upon the business that its growth was retarded. Yet under the most discouraging auspices iron making made some progress in the American colonies, for as early as 1735 the officers of the naval arsenal at Woolwich, England, reported to their government that the American iron they received was better for ship-building purposes than Swedish iron.

When our revolutionary war broke out, the iron furnaces of Pennsylvania were turning out about 6,000 tons of pig iron and 3,000 tons of bar iron annually. Maryland came next, with about half that production; and New Jersey, New York and Virginia were working into an iron-making business. The war of Independence had a stimulating effect upon our native iron industries, for they were required to furnish much war material, and the supply of European-manufactured iron was to a great extent cut off, leaving our native makers to provide for the market. By the time independence was achieved and peace proclaimed, the iron industries of the young nation appeared to have entered the way of prosperity.

When the confederation of the States was formed, it made no provision for the protection of its native industries. The United States started into life as a true free-trade country, there having been no restrictions placed on foreign imports. This system worked all right during the war, for foreign countries could not then trade freely with us. But so soon as peace was proclaimed the British merchants, following a policy from which they have never departed, flooded this country with cheap hardware, and closed all the furnaces in America. This caused wide-spread distress among those who were dependent on this work for their livelihood, and most of the iron masters were ruined, while all other lines of business suffered in sympathy with manufacturing depression.

The British teaching regarding this country was that agricultural pursuits were the proper line for our people to follow. They said: "Let you Americans go into farming, for which your country is so well adapted, and raise agricultural products for our market. We are ready to buy your corn, and cotton, and tobacco; we will keep an open market for your hides, and wool, and lumber. Your people will prosper by following business in that way, but do not attempt to compete with us in manufactures, for we are chosen to excel all others in these departments of labor."

This kind of reasoning was quite satisfactory to those parties who enjoyed ministering to British prosperity, but the majority of the people in the young American States had not then been schooled in free-trade theories. They were unphilosophical enough to believe that charity should begin at home; they could not understand how it was for their good that their iron business and other manufactures had been ruined, and a strong protectionist sentiment spread through the States. As a result of this, in 1790, protective import duties were imposed, and a defined policy for the protection of American manufactures was inaugurated. This effected a wonderful improvement in the condition of the States. When the people found they could not be readily undersold by foreign competitors, they willingly devoted their attention to manufacturing pursuits. Raw materials that had formerly been sent to Europe, in many cases to be returned here for sale with the added expense of labor and transportation, were now worked up in native factories. Within a few years the foundations of our industrial prosperity were laid, and the shield of protection prevented them from being swept away by the floods of European capital drawn from the hands of under-paid labor.

Compressing Iron, Hot or Cold.

The quality of movement of the particles of iron under pressure or percussion is a remarkable one, whether the change in the arrangement is made while the iron is hot or when it is cold. Red-hot iron can be pressed to fill a mold as clearly and exactly as so much wax could be, and the grain of the iron will certainly follow all the contour of the mold. Thus the head of pickaxes and articles of a similar form can be shaped by pressure, the metal that is removed to make the hole for the helve being forced to form the projection of the adze-like head. Cold iron can also be molded into form by pressure, a method largely practiced to finish drop-forged iron articles. The heading machine for making rivets, bolts and wood-screw blanks show some surprising results in the compression of iron; a No. 6 one-inch screw requires a piece of wire slightly more than ½ inches long to form it. Yet the total length of the screw blank headed is just one inch. Of this the countersunk shaped head is one-eighth of an inch by five-sixteenths of an inch widest or top diameter. Now it has been proved by experiments with shorter bits of wire that less than five-sixteenths of an inch of the extra eight-sixteenths is required to form the screw head. What becomes of the remaining more than three-sixteenths of an inch in length of an original 1½ inches that makes the one-inch screw blank? There can be but one answer—the iron is driven upon itself; in other words, three-sixteenths of an inch of wire is compressed into seven-eighths of an inch (measuring under the head), so that 1 1-16 inches of wire is compressed into seven-eighths of an inch in length without increasing the diameter of the wire.—*Manufacturers' Gazette.*

Handles for Cold Chisels.

The cold chisel is the crudest tool used by workers in the metals, albeit one of the most effective. It is a bar of cast steel with a wedge edge, varying from a parallel blade to a gradual thickening from edge to stock. Its work is always by percussion, and the material of the hammered head and the driven edge is the same, only that the latter is hardened and tempered. And yet, for some purposes, the cold chisel should have a handle of material differing from that of the bit or cutting portion. When the chisel is entirely of steel the blow is transmitted, with all its direct energy, to the edge. In many instances this blow "stunts" the edge, and leaves the thinner portion in the cut. Every "chipper" knows that much of his success depends on his skill in preventing this mishap. Yet for most of the ordinary work of the chipper the solid steel chisel is the best, on cast iron especially, and for starting and driving a keyway in wrought iron. But for the final chip, the finish, especially in yielding metals, as brass, wrought iron and soft steel, is better done with a chisel that softens the blow before it reaches the cutting edge. This can be accomplished by means of a wrought iron chisel with cast steel bit, the two being welded together. With such a tool, light, thin, smooth shavings can be taken, leaving the work almost free from the chatter marks that necessarily accompany the use of the solid cold chisel. These chisels were tested many years ago, and were proved to be excellent for the finish work on a job. They have not come into general use, probably because of the trouble and cost of making and relaying the chisels. For very delicate work, even wooden handles are—or have been—successfully used. The channeling of some small steel dies for working soft sheet brass could not be done by the solid chisel, but the work went well when the chisels were inserted in solid wooden handles. The handles, which were fitted with screw jaws for holding the shanks of awls, small wood chisels, screw drivers and similar tools, proved to be excellent for these light purposes. These wooden handles were fully as effective in chiseling by blows on copper and hard brass, when the solid steel chisel lodged in the metal or broke its edge if the blow was not in a direct line with the chisel.—*Scientific American.*

DRILLING AND BORING WOOD.—The hand-drill or breast-drill, originally intended for the hand drilling of metals, has taken its place among wood-working tools. In many instances it has displaced the bit-brace, or at least has filled a requirements left unsatisfactorily supplied by the bit-brace. The breast-drill may be used for drill, gimlet or bit, and its speed, on the best forms, may be changed at will without a change of speed of the hand. It has its advantage, also, in the more natural motion of the hand—the vertical crank movement, instead of the horizontal crank motion. A drilled hole in wood, for whatever purpose, is better than a bored hole. The drill cuts a clean hole, not merely finding its way between the fibres by displacing them, but removing the material entire as it advances. The gimlet form of wood-borer is crude at best; a thread at the end is supposed to enter the solid wood, and by spiral friction pull the cutting portion after it. The cutting portion is a twist like a twist drill or augur, supposed to deliver the chips, which it never does deliver. The pressure of the hand is necessary to force the gimlet into the wood, and the pull of the hand is required to release it and empty the chips. The drill cuts a clean hole, and has none of the objections of the gimlet. Unlike the gimlet it may be resharpened so long as it lasts. Its speed in the breast-drill is very much greater than that of the gimlet in the bit-brace.—*The Industrial World.*

STEAM ENGINEERING.—In working steam engineering up toward the condition of a science, practice, has for the past 50 years been constantly correcting the deductions of theory. Unforseen elements are constantly met with in practice that have neutralized and modified apparent facts. The gain from expansion has been found to have been greatly over-estimated, and the results that were reasonably expected from high pressure have not been obtained. Patient, practical research, with many failures, must be depended upon to further improve the steam engine.—*American Machinist.*

PECULIARITIES OF MANGANESE STEEL.—Manganese steel is very dense, tough and hard. It does not require to be forged or rolled to impart strength to it like most steel. It does not tarnish readily; magnet does not attract it. When brought to a white heat and plunged in water it turns soft and not hard. Its castings have very few flaws. It is made by pouring from 10 to 12 per cent of rich ferro-manganese into molten steel, and mixing the two together before the alloy is run off into ingots.

SCIENTIFIC PROGRESS.

Santa Barbara Natural History Society.

This society held its regular monthly meeting January 27th. The meeting was a very interesting one. After the reading of reports and the transaction of some other business, the matter of the purchasing of a valuable collection known as the "Clark Museum" was proposed and carried. A large number of minerals, Indian relics and other matters of scientific interest were also presented, and added to the already valuable collection of which the society is the possessor. An elaborate paper, supporting the theory of the ancient origin of the "Calaveras or Whitney skull," was contributed by Dr. Yates and read by Mr. H. C. Ford.. Mr. Ford also read a very interesting paper on

Fossil Wood,

Which he said was found at various localities throughout the State. Silicified wood is a variety of quartz. The wood fibre is gradually replaced by quartz, leaving the form of the wood intact, so much so that sections cut and placed under a microscope show the characteristic grain of the wood, by which the genera may often be determined and sometimes the species.

In the collection of the "State Mining Bureau" specimens are found from the following places in the State: Portorsville, Columbia, Lower Lake, Angels' Camp, Gold Run and Dutch Flat, Volcano, Burwell Valley, Calistoga, Chalk Bluffs, in great variety, San Luis Obispo county 20 feet below the surface, Santa Rosa wood before being silicified had been pierced by worms, and Mono Lake.

Continuing his remarks, he said: At the western base of Pike's Peak in Colorado I visited in 1869 a so-called petrified forest where stumps of trees several feet in hight and some 12 or 15 feet in diameter. One stump seemed to have been fossilized while in a charred state, from which I obtained fossil charcoal. Many of the specimens of wood were encrusted with layers of crystallized chalcedony of an opalescent tint, so beautiful that sections were mounted and worn as jewelry. At the mining exhibition of 1882, at Denver, and at Green river in Wyoming, I saw sections of fossil trunks of trees 20 inches in diameter and several feet in length like hollow tubes, with the interior surface entirely studded with pure quartz crystals. Upon the summit of a hill in the South Park, Colorado, our party obtained a large quantity of so-called wood jasper, fossil wood of nearly all the tints which are found in that form of quartz, many of which, with the lapidary's skill, were cut into ornaments of great beauty.

Specimens of fossil palm wood are found in Wyoming Territory along with the bones of the rhinoceros, showing a former tropical climate. Five examples of silicified palm are found on Cherry creek near Denver, Colorado, and in 1872 I carried from the locality to Chicago a palm stump weighing about 200 lbs.

The petrified forest near Calistoga, in this State, covers an area of about 20 acres, and contains about 100 fossil trees, some 40 feet long, all lying prostrate on the ground, pointing toward the north. In nearly all the localities where an abundance of such fossils are found, hot springs also occur either flowing at the present day or bearing evidence of having been active at a former period. Hot water seems to have been one of the agents through which the tissues of the wood have become silicified.

In the collection of Dr. Yates may be seen a fine example of a silicified mass of tules that the Doctor took from a hot spring near Clear Lake county. An exceedingly interesting specimen also in the possession of Dr. Yates bears evidence of having been bored by pholads before being silicified, and at a later period the cavities being filled with mud, which is also fossilized.

The large and valuable specimens donated to the museum of our society by Mr. Stearns was obtained by him at Unga Island, Alaska, where no living forests are found. One species of fossil palm is represented in the Miocene formation of Oregon, and one in the Pliocene of the Chalk bluffs of Nevada county in this State. Sesquereux has described eight species of fossil Sequoia found in Colorado, Montana, Wyoming and Utah, while we have two species, and the only, left as survivors of the past geological age. He also describes two species of Eucalyptus, one found at Black Buttes and the other at Green river, Wyoming. The Araucaria, Salishuria and Phyllocladas families found in Australia, Japan and New Zealand, also occur in this country in a fossil state.

The petrified forests near Holbrook, Arizona, contain such quantities of fossil wood that a company have recently purchased the tract and commenced the shipment and manufacture of the silicified wood into tablets, tiles, and various ornamental articles used in building and finishing. An establishment has recently been started in San Francisco for cutting and polishing the fossil wood taken from this wonderful deposit. It is stated that the article is fast driving California onyx from the market as a material for mantels, etc., as it is susceptible of a higher polish and is more durable. We collate the above from the Santa Barbara *Press.*

HYDROGEN BY ELECTROLYSIS.—Of all possible methods for the production of hydrogen, that of the decomposition of acidulated water by dyuamo-electric machines would appear, on the face of it, to be the most extravagant. Yet the question has often been put to the editor of *La Nature*, and in a recent issue the process is explained, and its practicability denied once for all. Supposing a perfect dynamo—that is to say, a machine capable of converting all the work of a motor into electrical energy; and also a perfect voltameter, having no resistance and using all the current in producing electrolysis of the water. Under these theoretically perfect conditions, a horse-power developed by a steam engine will in an hour decompose exactly 166 grammes of water, and set at liberty 18.5 grammes of hydrogen, measuring 206 liters, or 7.27 cubic feet. Supposing that practically the chemical action really utilized by the voltameter represents 70 per cent of the total energy; it follows that a horse-power can only produce 13 grammes, or 146 liters, of hydrogen per hour. The production of a cubic meter of hydrogen per hour would therefore require the total energy of about seven horse-power. Thus the production of 1,000 cubic feet of pure hydrogen by this method would be effected by the expenditure of nearly 200 horse-power for an hour; and the probable cost of the process may be left to the reader's imagination.

CONVERSION OF NEBULÆ INTO STARS.—The whole range of astronomy presents no speculations which have attracted more attention than the celebrated nebular hypothesis of Herschel and of Laplace. We shall first enunciate these speculations, and then we shall attempt to indicate how far they seem to be warranted by the actual state of scientific knowledge. In one of his most memorable papers, Sir William Herschel presents us with a summary of his observations on the nebulæ, arranged in such a manner as to suggest his theory of the gradual transmutation of nebulæ into stars. He first shows us that there are regions in the heavens where a faint diffused nebulosity is all that can be detected by the telescope. There are other nebulæ in which a nucleus can be just discerned; others again in which the nucleus is easily seen; and still others where the nucleus is a brilliant, star-like point. The transition from an object of this kind to a nebulous star is very natural, while the nebulous stars pass into the ordinary stars by a few graduated stages. It is thus possible to enumerate a series of objects, beginning at one end with the most diffused nebulosity, and ending at the other with an ordinary fixed star or group of stars. Each object in the series differs but slightly from the object just before it and just after it. It seemed to Herschel that he was thus able to view the actual changes by which masses of phosphorescent or glowing vapor became actually condensed down into stars.—*Popular Science Monthly.*

EFFECT OF PRESSURE ON THE MELTING POINT OF ICE.—The experiment of Bottomley, which apparently illustrates the fact that increased pressure lowers the freezing point of water is well known. A wire weighted at both ends is thrown over a cake of ice and cuts through it. The ice melts beneath the wire and freezes above it. Professor Guthrie, at a meeting of the Physical Society, held in London, April 28, 1883, gives his reasons for believing that the wire conducts heat to the ice from the atmosphere, and that the experiment does not illustrate the well-known fact that increased pressure lowers the freezing point. A silk wire, weighted to the same amount as a metallic wire, will not cut through a block of ice.

THE BEE has long been a type of the industrious worker, but there are few people who know how much labor the sweet hoard of the hive represents. Each head of clover contains about 60 distinct flower tubes, each of which contains a portion of sugar not exceeding the five-hundreth part of a grain. Some patient apiarian enthusiast, who has watched their movements, concludes that the proboscis of the bee must therefore be inserted into 500 clover tubes before one grain of sugar can be obtained. There are 7,000 grains in a pound, and as honey contains three-fourths of its weight of dry sugar, each pound of honey represents 2,500,000 clover tubes sucked by bees.

WATER-PROOFING MATERIAL.—When paraffine is thoroughly mixed with linseed oil, cast into small blocks, and allowed to cool, it may be used to make any fabric, as cloth, felt and leather water-proof by rubbing it with such a block, and ironing afterward to equalize the distribution of the material in the pores. If too much is not put on, the material may be made to be only impervious to water, but not to air, as the very small greasy pores repel the water but not the air.

CHLOROPHYL.—From recent researches it appears that chlorophyl, the remarkable substance to which the vegetable world owes the color of its foliage, is made up of two coloring matters, a green and a yellow, the relative proportions being 100 of the former to one of the latter. Both have been lately obtained in the crystalline state.

A MUSEUM.—Pasadena is to have a scientific museum, to be established under the direction of Gen. Edwin Ward, a gentleman eminently qualified for such an undertaking.

TO DEODORIZE KEROSENE.—A little chloride of lime, dissolved in warm water, left in a lamp or can which has held kerosene will deodorize it very soon.

MINING AND SCIENTIFIC PRESS.

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Passing Events.

The strike of the iron-workers in this city is over, the employers having taken men back at the old rates.

Rich gold and silver strikes have been made in the Elk mountains near the Colorado river, San Juan county, Utah. The outlook is that there will be a stampede of miners from northern Utah to the new mines. It is said the new mines are in a sandstone formation, like those of Silver Reef.

Very shortly now the prospectors will be out in the mountains again. The pleasant weather on this coast is in marked contrast to that on the other side of the mountains.

The miners' strike at Tuscarora, Nevada, and at Wood River, Idaho, continues. It is believed that the Tuscarora miners have made their last bullion shipments until the deadlock between the management and their employes upon the wage question is unbroken. The employers want the miners to work for $3 per day instead of $4.

At Butte, Montana, the outlook is rather discouraging. The recent drop in the value of copper has rendered mining unprofitable, and the Alice has already been closed down, and others will soon follow. In the meantime negotiations are going on between the railway and steamship companies, with the view of obtaining the lowest possible rates of freight to England. Miners' wages will probably be reduced, and everybody is anxious at the prospect.

ADVERTISE your non-contributing partners out of all claims. Don't do the work and allow "drones" to share the "clean ups."

Experiments with Filtering Apparatus for Leaching Process.

The solving process for the extraction of silver from its ores would be more commonly used, were it not for certain objections to its practical application. In the first place, ores containing clay and lime, or those which, if pulverized, produce very fine pulp or slime, are almost impossible to leach. Then, to leach large quantities of ore, a great number of tuhs or tanks for storing liquids are required. The time for leaching a hatch of ore is too long—from 30 to 72 hours, and the use of large quantities of liquid is required. An apparatus, invented by Juan F. Macay, designed to facilitate the leaching process, has been put at work in this city, at No. 23 Stevenson street, and during the past week tests have been made with it, which, being of a practical nature, and witnessed in part by a representative of this journal, we shall describe somewhat in detail.

In effecting the separation and filtration, it is important to keep the filtering surface from being clogged. In tuhs, they can only leach through a certain depth of ore, a very slow process. Mr. Macay uses a large, iron-bound wooden barrel, carrying inside it another barrel or cylinder, this inner one being perforated with holes, and is lined with asbestos cloth or canvas for filtering material. Between the inner and outer cylinder is an annular space, kept in place by longitudinal and circumferential partitions, the former of which divide the space into a number of distinct compartments, each provided with a draw-off cock for running off the liquid when separated by filtration. The cylinder is set so as to be rotated, and is provided with doors or manholes in one of the heads, by which the pulp may be introduced and undissolved residue removed. Through the hollow shaft or journal is a pipe into which air may be introduced into the space between the cylinders, so as to maintain a pressure in the space. When the reagents and pulp are put inside, the cylinder is rotated, and the solid matters are brought into intimate contact with the solvents or reagents, and by forcing in air to the space, the filtering surface is kept clear, as the ore has to pass through the filtering medium into the inner cylinder. Thus any solid matters that may adhere to the cloth filtering surface are disengaged from it, and the solid matters are kept in suspension in the liquid, so chemical action and a thorough admixture may take place.

The annular space between the inner and outer cylinder being divided into compartments by longitudinal divisions, the liquid which passes through into it is carried round by the rotation of the cylinder and flows back into the inner cylinder, thus helping to keep the filtering surface clear and unobstructed. When the soluble substances are dissolved or chemically acted on, and it is desired to separate the liquid from the solid matter, the draw-off cocks are opened, and then, by giving a slow rotary motion to the apparatus, the liquid may be decanted off from the bulk of the solid matter, and at the same time filtered from any such matter which it may hold in solution by passing through the filtering machine. By this rotary decanting action a practically clear filtering surface, unobstructed by solid matter, is constantly presented for the liquid to pass through.

The experiments and tests were made by Kustel & Co., of this city, at our request; Mr. Macay asking us to select some one to carry out the experiments, who would do so in a careful and satisfactory manner. The ore selected for the test was delivered to them in a pulverized state, and was passed through a coarse sieve in order to free it from coarse gravel and impurities. It was then thoroughly mixed and carefully sampled. To prove the fineness of the material, some of it was passed through a series of sieves, and proved to consist of 47 per cent passable through a 100-mesh screen, 9 per cent through an 80-mesh, 19 per cent through a 60-mesh, 16 per cent through a 40 mesh, and 9 per cent through a 30-mesh sieve. Most of the material that passed the 100-mesh sieve was of a clayish nature, which would furnish a considerable amount of slime in wet crushing, a disadvantage to the old style of leaching in tuhs. The coarse pulp was quartzose. Some of the ore was carefully concentrated in a pan, and proved to contain 1.1 per cent of sulphurets, chiefly consisting of copper and iron pyrites, with but little lead and silver sulphurets. The raw ore, proved by careful triplicate assays to contain $61.27 in silver and $15.07 in gold per ton. This 120 pounds of the raw ore was thoroughly mixed with 10 pounds of calcined salt and some sulphate of iron, on account of the low percentage of iron in the ore, and roasted in a reverberatory furnace for four hours. The ore was first roasted under a moderate heat for two hours, and the temperature gradually raised during the last two hours under constant stirring to effect the highest possible chlorination.

The ore was discharged into the pit below, and left to cool until next morning. The ore was subsequently sifted, mixed and carefully sampled. It proved by triplicate assays to contain 40.58 ounces of silver, or $52.47; 0.6 ounces, or $12.56 in gold per ton. A chlorination assay showed 74.6 per cent of the silver converted into a chloride. No sulphate of silver was detected in the roasted ore.

To test for working results in the rotary decanting filter, 70 pounds of the ore were charged into the barrel and just sufficient water (28 pounds) added to wet the ore before introducing the extracting solution. This latter was made by dissolving 13 pounds of hyposulphite of soda in 70 pounds of water, which is equivalent to one part of the salt to five parts of water.

The solution (83 pounds) was introduced into the apparatus, which was allowed to rotate at the rate of 20 revolutions per minute for half an hour, thus giving the solution plenty of time to dissolve the chloride of silver. Thereafter the discharge holes in the outer barrel were opened, and the silver-holding liquid allowed to flow into a receptacle.

The discharging of the liquid took about 20 minutes. The discharge holes were then closed, and air forced into the barrel by means of a pump (pressure of one atmosphere) for half an hour, in order to dry and free the pulp as much as possible from the silver-holding liquid. After opening the discharge holes and letting the last liquid flow out, a tailing sample was taken from the barrel, which proved to contain about 20 per cent moisture. The second washing of the ore was begun with a weaker solution of hyposulphite of soda, by dissolving 4 pounds of salt in 40 pounds of water, and the same manipulation repeated as with the first solution. Another sample was taken from the barrel after the ending of the second washing (1 hour), and it proved to contain about 21 per cent moisture. The third washing was done with 42 pounds of water, and another sample taken after the lapse of 1 hour, which showed 20 per cent of moisture. Total time consumed in three washings, *three* hours.

The three samples were hereafter treated as follows, in order to ascertain the amount of soluble silver left in the tailings as a double salt of hyposulphite of soda and chloride of silver after the three different washings; five ounces of ore were repeatedly treated with hyposulphite of soda until no reaction was obtained in the filtering liquid with sulphide of sodium. Then sulphite of sodium was added to the filtrate, the precipitate filtered, washed, dried and oalcined on a roasting dish in the muffle. The residue was then melted with pure lead in a scorifier, and the regulus cupelled. The obtained silver was found to represent the following values and percentage of silver left in the tailings in the form of a soluble double salt after the 1st, 2d and 3d washings:

No. 1, 5 oz. ore gave 0.064 gr. sil.=0.77 oz.=$1.00 per ton
No. 2, 5 oz. ore gave 0.023 gr. sil.=0.27 oz.=$0.33 per ton
No. 3, 5 oz. ore gave traces of silver.

In other words, 97.45 per cent silver was extracted after first washing; 99.1 per cent after second washing; and 99.8 (?) per cent after third washing.

Total loss of silver in the tailings as a soluble salt, only a small fraction of one per cent.

All of these tests were carefully executed, and mainly with the view of determining the amount of silver left in the shape of a soluble double salt in Mr. Macay's apparatus after the three different washings. The percentage of silver obtained refers therefore to the amount of chloride of silver present in the roasted ore, and no attention was paid as to the most proper way of working the ore and obtaining the highest possible bullion output, as this was not required.

Messrs. Kustel & Co. consider these tests prove the advantages of this system of dissolving and filtering over the common leaching boxes to be as follows: Ores too finely pulverized (100 to 120 mesh), or those which produce too much slime are practically impossible to lixiviate in the common leaching boxes, while in this new apparatus, according to the results obtained in the tests above described, with ore which contains 47 per cent of fine slimy material, from 97 to 99 per cent and a fraction of the silver were obtained, existing in the ore as chloride of silver, and this with only two washings. Considerable time is saved, as the dissolving of the chloride of silver is effected quicker and more thoroughly by revolving the barrel and mixing solution with ore, no matter in what condition of fineness the ore may be. By means of pressure the desilveration or separation of the silver-holding liquid from the tailings is accomplished to a higher degree and in a much shorter time than in the old way.

Much space would be saved if this apparatus can be made to hold ten tons and work six charges (60 tons) in 24 hours, while in the old way a large number of vats would be required to do this. A higher percentage of the soluble silver salts can be obtained than in the ordinary leaching tuhs, as with a large barrel and an increased pressure of four atmospheres the moisture or amount of silver-holding liquid could be reduced to a low percentage (five to ten per cent), thus effecting a higher saving of silver than in the old way, by which about $4 per ton of the soluble silver is lost on an average with the tailings.

Ordinary silver ores not of a very rebellious nature, say of an assay value of 40 to 60 ounces silver per ton, would require two washings only in this apparatus with hypo-solution, and 99 per cent of the present argentic chloride could be extracted. Should the ores be of a very base nature, a previous washing with water would be required before using the solution; or, if richer in silver, another washing after the two washings with hypo would be probably necessary.

Messrs. Kustel & Co. are of the opinion that this apparatus of Mr. Macay's could, with some modifications, be applied in the extraction of gold by means of chlorine, or the extraction of copper by the Hunt & Douglass process, and in fact in all those industries where large bulks of solid matter, coarsely or finely divided, have to be washed and the liquid separated by means of filtration.

Expenditures on Claims.

A memorial and joint resolution has been prepared asking Congress to repeal the law requiring annual assessment work to the amount of $100 to be done on unpatented claims, and substituting in lieu thereof the annual payment of $50 to the school fund of the county in which the claim is located.

This seems an injudicious movement. When work is done on claims it develops them to some extent, and the work done inures to the miner's benefit. But when simply a tax is paid for school in similar purposes no good is done to the mining interests at all. Moreover, a lot of wealthy men could keep any number of claims idle in that way, while poor men can better afford to work out assessment work than pay for it in money.

The step is one in the wrong direction altogether. We want men encouraged to develop their claims. In fact the present law has brought to the front many thousand mines which would never otherwise have been heard of. Men in doing assessment work prove the value of claims, and continue to work them. But paying a tax would never do this.

Moreover, when men do not now work their claims some one else will relocate them, and if they do they must work them to a certain extent. But a claim on which no tax was paid might be relocated, and the relocator pay the tax without doing any development at all. We have enough idle claims as it is, and want no more. The bane of the whole country is the fact that so many prospects are only worked when the law forces the owners to work them. Without a law to so compel work being done the number of undeveloped claims would increase. The present law is good enough, and if taxes are to be raised for school purposes they should be obtained without taxing the mining industry, which is heavily burdened under present conditions.

NEW settlers in the vicinity of Midford, Southern Oregon, are cultivating rice.

The Washington Monument.

Now that the great Washington monument approaches completion, renewed interest pertains to California's share therein. So many years have passed since California sent on her contribution that the fact is nearly unknown to the present generation. It is 33 years since the subject stirred the zeal and awoke the effort of the pioneers. In 1852 the California stone was hewn out of a quarry of the finest variegated marble at Ringold, El Dorado county, Cal., under the direction of John Bigler, Col. John F. Hall, and others and brought to Sacramento with an ox-team. It was shipped to Washington under direct supervision of Gov. Bigler.

About 15 years ago the report was brought to this coast that the California stone was not in the monument, and the following letter in answer to inquiry was received in this city:

OFFICE WASHINGTON MONUMENT SOCIETY,
WASHINGTON, D. C., Nov. 11, 1880.

OTIS V. SAWYER, ESQ., OF THE COMMITTEE OF THE SOCIETY OF CALIFORNIA PIONEERS, SAN FRANCISCO, CAL.—*Dear Sir:* In reply to your communication of 19th Oct. ult., I have to say that the information given to a member of your society, while on a recent visit to this city, by the superintendent and the watchman at the Washington Monument, touching the whereabouts of the stone presented by California, and of which you make inquiries, was not correct.

In the west wall of the moument, just above the platform, at the height of about about 150 feet from the base of the shaft, and easily seen, is a stone bearing the following inscription in sunken letters:

California,
The Youngest Sister of the Union,
brings her is Golden Tribute to the
memory of its father.

This memorial block was one of the last inserted prior to the suspension of operations on the mouument years ago.

The superintendent imagined that the inquiries made by the member of your committee referred to another stone, likewise from California, but which was *not presented on behalf of the State*. The latter stone was shipped in the year 1860, on board the ship *Flying Dutchman*, by the *miners of Columbia, Tuolumne Co., Cal.*, for a place in the Monument. This ship, after a speedy voyage, was at the last moment lost off the Harbor of New York, and the stone in question, as a consequence never came into the hands of the society.

Contributions of memorial blocks are once more being made by the States, organizations and societies of the country. A stone has just arrived from Switzerland, taken from the original memorial, William Tell chapel, erected in 1388, on the spot where Tell is said to have escaped from Gessler. Among the stones placed in the Lapidarium recently is one from Napoleon's tomb at St. Helena, and another by H. R. H., the Emperor of Brazil.

The work on the Monument is being rapidly pushed forward, and by the advent of Christmas 30 feet will have been added to the shaft this fall, and the Mouument will have attained the height of 190 feet. By May next, with the funds on hand, the Monument will reach an altitude of 230 feet. The iron stairway in the structure and the steam elevator are carried up with the masonry as it progresses. Should the Society of California Pioneers see fit to present a stone for insertion in the Monument, the society will be pleased to receive it. By direction of the Secretary, John B. Blake. Very respectfully, etc., F. L. HARVEY, Jr., Clerk.

It is a little singular perhaps that just at present there should have arisen another rumor that California was not represented, and it is now set at rest by the revival of the above document. It has also recalled the fact of money raised in 1852 by fixing contribution boxes at the polls during the presidential election of 1852. The largest amount raised by any county was gathered in Colusa county.

The original design was a white marble obelisk, 70 feet square at the base and 40 feet square at the apex, rising 610 feet, and there was to be a grand circular pantheon at the base. It was afterwards determined to dispense with the pantheon, and substitute a terrace of 17 feet elevation and 200 feet square.

The corner-stone was laid July 4, 1848, the block of marble used for the purpose being from Maryland and weighing 2,400 pounds. Disagreements among the managers delayed the work, and during 31 years only four feet in hight were added. This delay killed enthusiasm. At last, however, work was again commenced, according to the original design, with the terraces, except that the hight was reduced. This makes it still the loftiest column in the world. It will be, as the engraving shows, a plain obelisk, 70 feet square at the base and 470 feet high. While simple and majestic in form, without attempt at ornament, it will constitute a monument that will last for ages, erected by the people of the whole country to its greatest citizen.

We give on this page *fac similes* of some of the memorial blocks of stone used in the National Washington Monument. All the States have contributed. One, a black and white mottled marble from this State, has the inscription, "California, youngest sister of the Union, brings her golden tribute to the memory of its Father." Another is a block of granite, with the inscription, "The Citizens of Stockton, San Joaquin county, California. A tribute of respect to the Father of his country —George Washington. [Thirteen Stars] 1859."

It is expected that the monument will be completed and duly dedicated during the present year.

SPECIMENS OF MEMORIAL BLOCKS IN THE WASHINGTON NATIONAL MONUMENT.

A Profitable California Gold Mine.

The following is a portion of one of a series of letters on various topics, written by a prominent mining man to the *Engineering and Mining Journal*:

On our way to Plymouth, through the beautiful valleys of Amador county, we needed no guide to tell us that quartz mining is here prosecuted with great energy and success. Passing through Amador city, we visited the old Keystone mine. This property has paid dividends for 18 years past, and it is reported that sufficient ore is now opened up to keep its 40-stamp mill in operation for six years to come. They tell us that on the great mother lode, in this county, are located the best-paying gold mines in the United States.

This place (Plymouth) is a busy town of about 1,200 inhabitants. The Plymouth Con. Gold Mining Company's works are on the edge of the village. There are two large mills running 120 stamps, besides chlorination works, concentrators, blacksmith and carpenter shops, and all the usual outfit of a first-class mine. The plant is by far the largest in California, and has cost over $500,000.

Everything is run with the utmost economy and exactness. All the machinery is driven by water-power, which is owned by the company. The water is brought from the Cosumnes river, at a point 25 miles distant. The company's canals not only furnish water the entire year for power, but are also utilized to bring timber to the town. The enormous logs that are used to timber the mine, more than 600 a month, instead of being hauled over bad roads, at great expense, are easily floated down the canal from the mountains and dropped into the company's yard, almost without cost. The two mills crush an average of about 250 tons of rock a day. The one last constructed, known as the Pacific mill, is one of the best equipped in existence. The United States Treasury Department, in its report on mining, says of this mill: "It is considered a model one for effectiveness and economy. When Prof. Thomas Price was appointed purchasing agent for the great mining company at Transvaal, in South Africa, he examined several mills in this State, and after comparison, he decided to build a duplicate of the Plymouth mill."

There are three shafts, the newest one being the best shaft on this coast. It has three compartments and is vertical.

The company owns about a mile in length on the lode, and of this less than a quarter has been prospected. The principal mine consists of an immense chimney of ribbon quartz, milling an average of about 13 dollars to the ton. The ore-body is from 30 to 50 feet wide, and about 400 feet in length, and is open to a depth of 1,310 feet. I was located in 1852, and to the present time gold to the value of about four millions of dollars has been taken out, and the mine now looks stronger and more permanent than at any previous period in its history. The ore mills freely and contains one to two per cent of sulphurets. One feature of the mine is its freedom from water in large quantity. No pump is needed, a bucket running a few hours a day being sufficient to keep the mine clear. The temperature is moderate. Only two shifts of men cover the 24 hours.

It is interesting to note that after the ore is dumped into the "skip" at the bottom of the shaft, it is not touched again by human hands. Hoisted to the top of the high frame, the ore is dumped into the rock-breaker; thence into a car; then run to the mill, and finally dropped into the bins, whence it finds its way into the batteries by a self feeding apparatus, and only comes forth as gold and sand.

Extensive prospect work is now under way. A tunnel is running south, where it is believed the company has a valuable body of ore. A shaft is also sinking east of the old ones on an entirely new vein, which already gives promise of future greatness.

Messrs. Hayward and Hobart, of San Francisco, two of the trustees of the Plymouth Company, give much time to the management of the property, assisting the able superintendent by advice that their long experience makes valuable. One fact not to be overlooked is, that all stockholders, whether great of small, share *pro rata* in all the profits made. There are no mills owned by the officers, or wood contracts, or other devices, by which a few profit at the expense of the company.

The following are the items of production and operating expenses for the past twelve months:

Gold produced, 12 months, to December 1st, 1884	$1,022,543.22
Expenses	346,638.33
Net product	$675,904.89

During these twelve months, the company has paid regular monthly dividends of $50.000, making a total of $600,000 for the year.

This company is now paying larger dividends that any gold mine in North America, and is in a highly prosperous condition. The country about Plymouth is quite unlike that of most mining sections. Instead of barren rock or desert, there are fine farms, vegetable gardens, cultivated fields, and pleasant woods—a pretty country to live in. It is in the foot hills of the Sierra Nevada, about 900 feet above the sea, comfortable in summer and not too cold in winter.

This county and Nevada are now the leading gold producing counties in the country, and in both there is great activity, and new discoveries are constantly made.

The Blind.

At a recent lecture before the Cooper Medical College, forming one of the Lane Free Lectures, Prof. Adolph Barkan spoke concerning "The Blind." In beginning, the lecturer referred to the events that influenced his career and caused him to be in his present position. An account of the Vigilance Committee of San Francisco of 1856, read when he was at his home in Hungary, made a great impression upon him, and he resolved to live in this city some day. A blind aunt directed his attention to diseases of the eye. He announced his intention to treat the subject ethnologically and psychologically; at a future time the principles of the hygiene of the eye and the prevention of blindness would be treated of.

The earliest mention of the blind is in the Talmud and the Bible. In Egypt, the cradle of the Jewish people, there is still an immense number of blind, the affliction of so many caused by the so-called Egyptian eye-disease, which during the wars in Egypt, under Napoleon I, made such ravages among the French soldiers, by whom the infection was subsequently spread over the whole continent of Europe. The average of blind in Central Europe is 8 in 10,000; in Holland, only 4 in 10,000; in England, Italy and Hungary 10 in 10,000; Norway and Finland, 18 in 10,000. In Norway the high percentage is due to the great age attained by the inhabitants, the longest lived of any people in the world. The number of blind over sixty years of age in Norway is fourteen times as great as in North Germany. In the western half of the globe, the number of blind seems to increase as we go southward. In the British dominions the average is about 5 in 10,000; in the West Indies, 22 in 10,000; in the Southern States, 7 in 10,000. In China the number of blind is strikingly large. Educational blind asylums have existed three thousands of years. The blind in China are far above the level of the masses intellectually, forming a large class of wise men, prophets and minstrels. In Japan there are also many blind, the affliction of half of this number being caused by small-pox. Japanese blind are generally employed as body shampooers in bathing establishments and in private houses.

The factors of blindness differ materially in different countries. The number depends greatly upon the relative number of infants and aged persons. The greater number of children born in a country, other things being equal, the greater will be the percentage of the blind. Climate is an important agent in eye diseases. The glare of hot countries and the reflexes of snow regions are unfavorable to sight. Mountainous regions are considered more favorable to the sight than flat-lands. Brown eyes are more subject to blindness than blue. According to United States statistics, 5 in 10,000 white people are blind; 7 in 10,000 negroes. There are estimated to be 1,000,000 blind people on the globe.

Grades and kinds of blindness were described. In some cases an object must be a certain size in order to be seen. About 75 per cent of blind people are born blind. Affection of the eye by heredity is common.

In vocations, mechanics are particularly subject to blindness from accidents. Out of 14,000 persons treated by an artificial eye-maker in Paris, 1,000 had lost an eye in childhood, for the most part from gun shots and explosions of percussion caps. It was thought by the lecturer that it would be advantageous to the community if some other way of celebrating 4th of July could be devised, as it is a fruitful source of blindness. The diseases of cataract and granulated lids were spoken of.

The exquisite sense of touch of the blind was illustrated, and anecdotes were related of their fine sense of hearing. The blind surpass those blessed with sight in the retentiveness of their memory. The question of the intellectual development of the blind was a topic much agitated in the eighteenth century, and it was at that period that Diderot's writings on this subject appeared. Some of the fruitful lives and achievements of blind people were referred to. The benefits enjoyed by the blind in various institutions of the world were remarked, and the system and management of the State institution at Berkeley were described and praised. "There," the lecturer said, "the blind and deaf-mutes lead an almost enviable existence in one of the loveliest spots in the world."

In conclusion, the lecturer spoke at length of the urgent need of aid for adult blind, who are not permitted at present the advantages that blind children possess, and the bill at present before the Legislature to establish an industrial home for this class of unfortunates was mentioned in favorable terms.

MINE VENTILATION.—The *Park Record* (Utah), in speaking of the Sampson mine, says: The drain tunnel on this property has been driven in some 600 feet, and is being pushed as rapidly as circumstances will permit. Bad air made it necessary for a shaft to be sunk from the surface to connect with the tunnel about 200 feet from its mouth. This was done, and a box ventilator 12 inches square was run from the shaft to the face of a steam pipe connected with it, where it begins to rise in the shaft, and when a shot is fired the stream is turned on, creating such a draft as to draw all the bad air and smoke out almost instantaneously. The arrangement is a very ingenious one, and is far ahead of air compressors and fans. The company has resumed work in the stopes from the 200 level, and considerable ore is being shipped by them.

Custom Smelters.

From the preparations now going on in several localities it is certain that a large number of well developed mines, which have been idle for one or more years, will be vigorously worked early in the spring, and an enlarged production from them maintained during the year. Litigation and disagreements among owners, in many instances, have been arranged so that work can be resumed. On other properties owners have given up experimental tests looking to the erection of special works for the treatment of particular ores, having become thoroughly satisfied that the competitive cash ore markets are really more to their advantage than are private works under their own supervision. This conclusion is not a hasty one, because repeated and costly tests of every kind have been made so carefully as to leave no doubt in the minds of mine owners, and hence their decision is an emphatic endorsement of the superior facilities possessed and carried out by the large smelting establishments of the valley cities.

When men of ample capital and shrewd business judgment thus openly abandon the project of erecting private reduction plants because they find it to their interest to contract their output or place their ore in open market it looks very much like an admission that our established smelters cannot profitably be competed against by individual works. It also conveys the impression that experienced smelters are doing work at reasonable rates, and therefore giving satisfaction to their patrons. It is easy to talk against the charges of the smelters, but when business men, who own one large property merely, begin to ponder the subject of construction, they find so many ramifications to it, requiring the outlay of much capital, and the employment of constant personal supervision, that they hesitate to inaugurate the enterprise, and come to the very sensible conclusion that mining and smelting are not necessarily one and the same thing, in a legitimate business point of view. The more the subject is made a study, the less attractive reduction becomes in the face of existing facilities. Colorado has to-day the best ore markets, and the best and cheapest reduction advantages of any mining country in the world. Certain camps may, of course, have all the requisites for the inception and successful operation of smelting plants, but individual works are no longer to be thought of in comparision to works started and operated for the general reduction of all kinds of ores.—*Denver Tribune-Republican.*

Marking and Apex of Mines.

In the case of Eilers vs. Boatman, the Supreme Court of Utah decided the following points:

"The occupant of mining ground on the Government domain will be protected in his right where his appropriation of it is by means which are a substantial compliance with the law, and which, in view of all the surrounding circumstances, impart notice to those who have a right to know that the particular mining ground is subject to the dominion of some private claimant; therefore, a mining claim is sufficiently marked out on the ground where stakes and monuments are set at the accessible parts, the inaccessible parts being definitely referred to by courses and distances which are sufficient to point out to any one honestly endeavoring to ascertain where the lines of the claim run. The claimant is not required to be exact in running the lines or in fixing the corners or other posts; a difference of a few feet or a few points between the monuments fixed at the time of the location and those fixed by an actual survey for patent is immaterial, and does not affect the validity of the original location, nor the right of the claimant to the ground as surveyed." * * "As between two locators and as affecting their rights only, one cannot locate ground of which the other is in actual possession under claim or color of right, because such ground would not be vacant and unoccupied; but the possession of a vein recognized by the mining laws to which protection is given is by one who holds the surface where the vein makes its apex." * * "The location of a vein or lode made upon the surface where the vein or lode finds its apex will not be defeated by the secret underground workings and possession by parties having no possession of or right to the surface embracing it."

MECHANICS' INSTITUTE DRAWING CLASS.—At a recent meeting of the management of the Mechanics' Institute, it was decided to establish for the use of members a free drawing class, for the purpose of giving those ambitious in that direction an opportunity for obtaining a freer use of hand and pencil and a more general knowledge of design as applied to manufactures and the useful arts. Professor Edward T. Baxter has been engaged as instructor, and immediate steps will be taken to provide a suitable, spacious room and the necessary furniture, and also a suitable collection of mechanical models, ornamental and architectural designs, engravings, books and illustrated publications for study and reference. The classes will meet three evenings during each week, and half-hour sessions will be held. The pupils are to furnish their own drawing paper and instruments. Manufacturers will be solicited for contributions of specimens of their various products and donations of illustrated catalogues will be gratefully acknowledged.

The Father de Smet.

At the annual meeting of the Father de Smet (D. T.) mine, held in this city last week, the following were elected: J. B. Haggin, president; Thomas Bell, vice-president; Henry Deas, secretary; Bank of California, Treasurer; Laidlaw & Co., transfer agents in New York; George E. Webber, Jr., superintendent; directors—J. B. Haggin, Thomas Brown, Thomas Bell, Thomas Menzies and Irwin C. Stump.

The bullion produced from ore during the year amounted to $474,552.94; disbursements, $234,200.70; net profit for 1884, $240,352.24. Total number of tons of ore milled during the year, 106,540; average value per ton, $4.45.

Total number of dividends paid during the year, 10 (Nos. 31 to 40 inclusive), at 20 cents per share, $200,000.

NEW SMELTER.—We learn that Mr. Brown has nearly completed his arrangements for the erection of a smelter at Kingman. A smelter at Kingman would, in our opinion, be of great benefit to that town, to the surrounding country and to the railroad company. The latter would have an increase of its carrying trade to Kingman, and no great decrease in its freightage from that point. If the ore in the lodes around Kingman was of a uniformly high grade, it would be plain that it would be to the advantage of the road that no smelter should be erected at Kingman, as in that case the road would be sure of the profit on the transportation of the ore to the smelters outside. But there is a vast, incalculable quantity of ore here of a grade which will not bear transportation, but which will pay richly if worked here, and which will remain here and never be shipped. The road will have a heavier freightage on fuel and fluxes to the smelter than it has now on the high-grade ore selected and sent forth here; and the transportation of the bullion counts for something. Besides this, the fact that low-grade ore could be profitably worked here would give an impetus to mining, and one smelter would be but the beginning, and would be followed by the erection of others. One smelter erected at Kingman insures an active town there with the certainty of increase of population and business. We wish the enterprise every success, and believe that it is to the interest of the railroad to aid it by giving it every advantage of special rates that can be fairly given. —*Mohave Miner.*

PROSPECT MOUNTAIN.—Time and development on the mines of Prospect mountain seems to be all that is needed to show up the great wealth hidden there. Maurice Hartnett, one of the most reliable and conservative miners in Eureka district, speaks confidently of the future of that section, and says that when a leaching process mill is established here that will reduce ore that assays from $20 to $30 a ton at a profit to the mine owner, that that section will keep such a mill busy for years to come. Such ore is there in abundance, and it is readily and easily mined. Several of the mines thereabouts are shipping rich ore to the furnaces here, but he believes that if they ably managed the showing in the way of bullion shipments they would make, would awaken some of the mining men of the coast out of their dormant condition. He believes the present stagnation in mining matters in Eureka district is only temporarily, and despite the acts of interested ones to keep the district back, it will vindicate itself before long.—*Eureka Sentinel.*

TOO MANY PEOPLE.—The revival of active operations in Candelaria and Belleville has been greatly exaggerated in the minds of those who are idle and living away from both places. The result is that both towns are full of idle men—it amounts to three or four men where there is employment for but one. In many cases these people have reached their destination without means, and are now recipients of charity. This bears hard upon those who have weathered the many dull days of the past year, those who have had to cut corners on expenses, and who even now, though employed, are obliged to be very economical to pay up their past indebtedness. In consideration of the chances for obtaining work being very limited, and the accommodations equally so, it is hoped that those who contemplate visiting either place, in search of work, will stay away—it is not here for you.—*Candelaria True Fissure.*

SWEETWATER.—An old Comstock miner, just returned from the Sweetwater mines, in Mono county, says there are about twenty miners in the camp, all working for themselves and making more than wages. The ledges have about the same dip as those on the Comstock, but carry very little gold. The ore is free milling, and averages $85 per ton in silver. It is packed eight miles to the mill on mules. There is plenty of wood and water close by, and the miners will soon be able to put up a mill of their own, convenient to the camp, which will greatly reduce the cost of milling.

ISAAC L. REQUA has resigned from the superintendency of the Chollar and Potosi mines and the Combination shaft, and A. C. (Lon) Hamilton has been appointed to succeed him.

BRITISH consumers, according to the estimate of the London *Economist*, have saved $30,000,000 by the fall in the price of sugar last year.

American Woods.

There are said to hs 36 varictics of oak in the United Statcs, 34 of pine, 9 of fir, 5 of spruce, 4 of hcmlock, 12 of ash, 3 of bickory, 18 of willow, 3 of cherry, 9 of poplar, 4 of maple, 2 of persimmon, and 3 of cedar. Tho New York Muscum of Natural Hlistory is to have a complete collection of the native woods of our entire country. The logs are being prepared for that purpose. They will he for the most part five feet long, a section of half the thickness of tho log at one end being removed. In this way hoth the longitudinal and transvsrse grainings aro shown. Thero is also a diagonal cut on the section, which displays the graining also. The remainder of the log remains in its natural condition, with the bark attached.

Hickory.

Some of our native woods cannot be superscded, or evcu equalled, by any woods of foreign growth. For many most useful purposes there has never been found, anywhere, auy wood possessing the excellent quali ics of our native hickory. It is not, as commonly supposed, that good hickory must be grown in the north to be of the best; its habitat extends from the Green Mountains in Vermont, following the coast range, the Alleghanics, and the Blun Ridgs througb the Carolinas, and even to uppsr Florida. And, contrary to geueral supposition, the very best of the hickory ussd in the arts, where toughness is required, is obtained from North Carolina and eastern Tennessee. "It is wonderful what toughness the hickory timber of that mountain region is capable of," said a wheel maker recently. "We can turn a piece completely around a circle without breaking a fiber." This, of course, after it is thoroughly steamed.

The Color of Hickory

Is not improved hy lying in the log. It is exposure to uir that deepens the color of all timber. If the lumber is sawn up and piled under cover in a dry, airy shed, it will continue to improve in valus for six years. In piling it, the edges of tbe hoards shonld he covered by the cross pieces, to prevent splitting, and the cross pieces should be directly over each otber, and sufficiently close to prevent hending or warping of the boards. Limbs and crotches of hickory or walnut, as it is sometimes called, are tbe most valuable parts of the trees, being better veined and grained than the stem, and are too valuahle to make posts of. The small limbs can be sawed into small stuff or squared for turning work.

Yellow Pine

Is another largely distributed and valuable American wood; but it is not so generally known tbat it is valnable for cabinct and ornamental work as wsll as for timber and other heavy use. Workers in ornamental wood now assert that yellow pine, hard finished in oil, is the rival in beauty of any wood that grows, not excepting the costliest of the hard species, it heing susceptible of receiving and maintaining as high a degres of polish as any known wood, while, when impregnated witb oil, it is almost indestructible. In such a condition it is impervious to even hot grease snd other substances tbat leaves an ineffaceahle stain upon white pine, maple and various other woods.

The Chestnut

Is also a useful and characteristic American wood, although it is indigenous in some other countries as well. There is a common tradition that the timbers of most of the old churches in Europe were chestnut. If this were the cass that species of timber must have been quite common in some countries whsre now it is extremely rare. Old oak timber is sometimes mistaken for chestnut. M. Payer, of Paris, has recsntly produced a large number of specimens of timber from the old churches and buildings in Paris, which be has subjected to careful examination, and he believes that none of them were chestnut. If lsters are drawn upon oak and chestnut planks, by means of pure sulphate of iron dissolved in distilled water, the charaeters appsar at once, in hlack, upon tbe oak, and in deep violet upon the chestnut. Ammonia produces a red color, of short duration, upon the chestnut, paler and lsss distinct upon tbe oak. All the French and American varieties of oak show very distinctly, on their transverse sections, medullary rays crossing the woody fihers from the center across ths circumferenes. Chestnut timber possesses only concentric layers.

A VALUABLE PAPER.—The MINING AND SCIENTIFIC PRESS of January 24th, is an excellent number, containing as it does an exhaustive review of mining affairs on the Pacific Slope during the year just closed. A full page, with a good map, is devoted to the New River district in this county. Every miner and mechanic in California should he a subscriher to the PRESS, as it is devoted exclusively to their interests, and every numher is filled with valuable information.—*Trinity Journal.*

THE Executive Committee of the United States Association, at the New Orleans Exposition, waited on President Arthur, Saturday, and presented a statement of the affairs of the Exposition, together with a memorial to Congress, asking an additional appropciation, which he was asked to transmit to Cougress, with his approval.

USEFUL INFORMATION.

Receipts for Shoe Blacking.

A brilliant paste blacking may, according to Dick, bo prepared by mixing two pounds ivory black, one pound molasses, one-fourth pound each of olive oil and sulphuric acid, and enough water to reduce the product to the proper consistence.

Herr Artus recommends thn following formula as lcss destructive to leather than most hlacking in use: Mix thoroughly three and a half pounds vogetablo black, one and a half pounds ivory black, five pounds each of molasses and glycerine; cut six ounces gutta percha into small pieces, molt, and when fluid add twenty ounces of olive oil, and afterwards two ounces of stearin; stir, while hot, tbe second mixturs into the first, and then a further addition of gum senegal dissolved in three quarts of water is made. This may he kept as stock, and for use diluted with ahout three times its hulk of warm water.

For liquid blacking without sulphuric acid, mix one pound finely-powdered ivory black, thres-eighths pound molasses, two ounces sweet oil, and one pint eacb hcer and vinegar. Mix the first three ingredients vsry thoroughly togetber before adding tbe last two.

A better liquid hlacking may probahly be made by the following formula: Mix one pound each of ivory black and molasses and onsfourth pound of sweet oil, and gradually add one-fourth pound of sulphurie acid diluted with three timcs its weight of water, mix well, set aside for three hours. Reduce to proper consistsncy with water. Owing to the calcium phosphats prcsnt in the ivory hlack, the sulphuric acid is provided with a bass to unite with, and does much lcs to injure the leather tban is generally supposed. The addition of sulphuric acid greatly adds to the brilliancy of the blacking, but it should hs used in no larger quantity than necessary for this purpose.

CASTING PLATE GLASS.—The operation of casting a plate is as follows: Tbe glass in the pots having attained the proper degrse of liquidity, and having received a thorough melting and refining, the fire is slackened to render the mass somewhat viscous by cooling. The doors in front of the pots are lifted or taken away; the workmen, witb a long pair of iron pincers, take hold of tbe pot in the furnace, bring it upon an iron truck or carriage, and at a dog-trot carry it under the crane. The impurities or glass gall upon the surface of the glass are now scraped off and the pot carefully wiped on the outside with a wet cloth to prevent dirt from falling upon the casting table. Tbe pot is now seized by a pair of strong iron tongs or nippers, and raised over the table hy means of the crane. The casting table is a large cast iron slab, well polished, mounted upon a carriage running over a railway. Upon tbis table two iron rules of tbe thickness of tbe required plate are now laid ou each side. Tbe pot suspended above is now tilted over and the glass poured upon the table. A heavy iron roller is now passed over the glass, the ends of which rest upon the thickness rules. During the rolling, if any impurities are detected in the glass when yet plastic, they are removed with suitable instruments. The plate is then annealed, after which it is ground, smootbed and polished, each being an operation requirlng time and care.

NICKEL COOKING UTENSILS.—In regard to the supposed poisonous naturc of nickel it may be rema·ked that nickel and copper alloys bave long been in use for domestic utensils, as well as copper itself. Such vessels must, of course, be protected from acids, and always kept clean and hright. When this is done none of the metal passes into a soluble form. All metallic salts are more or less poisonous, even the salts of iron, to which tbe salts of nickel are more nearly related thau to thosc of copper, which are indeed quite poisonous. Metallic vessels should always he kept clean, and this is true of nickel too, and there is no need to concern ourselves ahout its poisonous character. It would he very desirahle to have thorough and careful experiments made upon the physiological action of nickel salts when in solution. Birnbaum has shown that solutions slightly acidified with acetic acid, as well as the juice of sour cherries, when left for some time in nicksl vessels take up considerahle quantitiss of nickel, which confirms the view ahove expressed that acid solutions should hc kept as far away as possible from all such utensils and vessels.

KEROSENE FOR PAINT BRUSHES.—There is notbing hetter tban kerosenc for cleaning paint brushes after they have been laid aside for a long time. If it is in a very had coudition, cut off a layer of hristles on the outside, and soak it two or three days in kerosene oil, when the bristles become pliahle aud easily cleaned hy a free use of the oil and hy working tbe brush on a piece of hoard. If thoroughly cleaned with kerosene, after use, and then set away where it can he kept clean and dry, it will remain for months soft as when new. Brushes may thus be kept in prime condition, whereas, when set away in water, they are forgotten, and the water evaporates and leaves them well-nigh worthless.

TINNING KNIVES.—All knives that have that appearance are not covered with silver. Pure hlock tin is often used for tinning knives and iron spoons. The articles are thoroughly eleaned from oil or grease in a hot alkali bath; then if free from scale dip in a solution of muriate of zinc to which has been added a small piece of sal ammoniac, dry quickly over a hot plate of iron, or furnace, and immerss in a bath of melted tin for a few seconds. Have the surface of tbe melted tin kept clean by skimming and sprinkling with a little powdered resin.

A NEW BOULEVARD PAVEMENT of prepared gum wnod is undergoing a trial on Chestnut stroet, St. Louis. After the roadhed is dug out and rolled a layer of concrete is put down and coated with sand. This is glazed with coal tar, on which five-inch gum-wood hlocks are set uprightly, with an ordinary lath between the rows at the bottom to separate them. This space is filled part way up with coal tar, and the remainder with sand and gravel, which is rammed in compactly. This pavement is firm, elastic, and apparently noiscless, but costly.

LUSTROUS POLISH FOR CABINET WORK.—A fine, lustrous polisb for dslicate cabinet work can be made as follows: Half a pint of liuseed oil, balf pint of old ale, the white of an egg, one ounce of spirits of wine, one ounce spirits of salts. Shake well bcfore using. A littls to be applied to the face of a soft linen pad, and lightly rubbed for a minute or two over the article to hs restored, which sbould be first rubhed off with an old silk handkerchief. It will keep any length of tiuc if well corked.

FOR MENDING LAMP TOPS.—Use a csment prepared hy hoiling three parts of resin and one of caustic soda in fivs of water. This composition forms a soap, which when mixed with half its weight of plaster of Paris sets firmly in ahout three-quarters of an hour. It is said to bs of great adhesive power, not permeable hy kerosene, a low conductor of heat, and but superficially attacked hy hot water.

THE toad, frog and chameleon cap'ure insects by darting out the tongue, which is tipped with glutinous saliva. The hoa constricting serpents crush their prey in their coils before swallowing, and the venomous snakes have a poison fang.

GIVE THE FLIES A CHANCE.—In putting up your screen doors and windows he very particular to have a little hole in one corner so that the flies can go outdoors when they get tired of being inside.

GOOD HEALTH.

Rheumatism.

EDITORS PRESS:—I have long contemplated giving to the world a valuable receipt for rheumatism in all its forms. It is a disease that a great many are troubled with, especially miners, and one that can only he reached hy internal remedies. Embrocations or liniments rs move the pain or swelling, but do not cure the disease. St. Jacobs oil may be applied to the ankle, and the pain ceases to exist there; but tbe next morning it will be found in the knee, wrist or shoulder. Nature always makss a desperate effort to keep disease away from the vitals. Rheumatism is a disease of the blood, and if you examine the blood of one who is suffering with the disease, tbe microscope will show you the fibrin all broken up, and the blood of a darker color. Among the rheumatic, as damp weather approaches, more or less expansion of fibrous and serous tissues occurs. These sxpanded muscles or tissues press upon their accompanying nerves, producing more or less pain, according to the degree of pressure, as wsll as to the degree of sensitiveness of these nerves, and as soon as clear pleasant weather approaches, the muscle or tissue returns to its original condition, the pressure upon tbe nerves is removed, and tbe patient then becomes free from pain, and imagines himself well. You must pay strict attention to the laws of health. Medicine can only remove the present difficulty. If you go on violating those laws you must continue to suffer.

Here is the remedy that will cure in nearly every casc, and you can get it put up at any drug store. It will help you even if you have hypertrophy of the hsart, caused by rheumatism, although that cannot be cured. *Receipt.*—Take 12 ounces compound syrup stilliugia, 4 ouuces tincture cimicifuga, 1 ounce iodide of potassium; mix. Dose one teaspoonful to one tahlespoonful before each meal, and continuc its use a long time after all pain has ceased.

S. G. TURNER, M. D.
Howell's P. O., Arizona.

Good Common Sense.

EDITORS PRESS:—I no iced in a late issue of your paper a letter from Mr. Rumford concerning the Edenic diet, etc. As I have had some experience with extreme measures on the diet question, I feel that I can speak as one not entirely without authority.

After some years of ultra-vegetarianism, at the end of wbich I found myself almost ready to pass on to the next life, and put off entirely this poor little starved body, I have come back to this principle, *i. e.*, to eat whatever best nourishes and agrees with one, guarding very jealously every means hy which digestion and assimilation may be best promoted, carefully avoiding ths cultivation of auy uotions tending to extremes.

Living on bread and iruit for a long time, my digestion became so enfeebled, and I gradually became such a sufferer from inanition that finally I could not digest eveu bread and fruit. Just before tho time at which, in tbe natural order of things, I ought to have died, I tried beef broth, upon which I began to rally. I lived for months upon broiled beef and bread, and even now can digest very little fruit.

With many persons a return to ths state of nature scems the one great hobby. They forget or ignore the fact that we are the result of countless ages of departure from that state, and what was once a deviatiun from natural conditions may, become through unnumbered gencrations, as strong as nature itself to us.

A "return to a state of nature" would mean for us simply this: To walk out of our *unnatural* honses of wood or brick, put off our unnatural clothing of wool or cotton (cultivating the *natural hirsute* covering), throw away our combs and brushes, our pens, pencils, books, papers, all works of art, and "take to the woods" of Darwin's past ages. Such a consummatiou could hardly he ons to "devoutly wish for."

I thiuk one whose digestion is feeble, can soon ascertain what plain, nourishing food best agrees with him, and, as one of the publishers of the PRESS said to me not long ago, "Get the very best of that kind of food, and eat it under the best conditions." I believe any extrsme measures in dict or tho adoption of any "cranky" notions will soon or late lead one to the slough of inanition and debility.

CARRIE STEVENS WALTER.
San Jose, Jan. 30, 1885.

Danger from the Looking-glass.

There seems to be no end to the catalogue of perils to which we poor humans are exposed while peacefully sleeping in our heds, or engaged in the ordinary and quiet duties of life. Every few days we are startled by some new discovery from some previously unsuspected source of evil—the wall-paper, tbe carpet, the furnace, the drain, the fresh air, etc. We have just heen startled with the hitherto unexpected presence of danger in dress goods, window-hangings, bandboxes, etc.; and now comes the most unexpected alarm from one of womau's best and most frequently consulted friends, the looking-glass. One which has heretofore been considsred an angel of light is now transformed, into a worker of deeds of darkness.

A German M. D., one Dr. Newkirch, reports having met with several chronic cases of mercurial poison. In two cases, at least, that of a man and his wife, the cause was traced directly to a looking-glass in their bedroom, the wooden back of which was dotted all over with thousands of minute globules of mercury. Tbe apartment was heated during tbe nigbt. In another instance tbe source of the poisoning was a mirror, 40 ycars old, wbose back had become weak and from whose face the quicksilver freshness was fading. The aged culprits having heen summarily removed their victims speedily recovered. Thus has yet anotber of our trusted friends been proved false! And now we must either destroy our mirrors whils they are yet young and innocent, or else keep a watchful eye on them and hrace up their backs the moment the sign of decrepitude becomes apparent. If worse comes to worse, we can at least take rsfuge in the hurnished steel of our forefatbers.

DAMP HOUSES.—Charles T. Davis, in the *American Architect:* The commou bricks produced by most of the dry-clay machines absorb much mors water than do those made by machines which thoroughly temper ths clay. There is too much ignorance displayed in regard to the material produced by this line of inventions, and which enters so largely into the construction of huildiugs, and this lack of knowledge is often shown hy those who ought to know better. In the desire to get up a showy house, "something that will take, you know," mistakes are often made, and which are usually paid for hy the loss of health, and sometimes hy the sacrifice of the lives of those who inhahit them. Is it difficult to call to mind houses that people call "unlucky places," in which an unusual number of persons die? These "unlucky places" are for the most part nothing more or lcss than damp houses, resulting usually from the employment of porous brick in the construction of tbe walls.

IRON SEWER PIPES NOT ALWAYS SAFE.—Prof. Austin states that many clay and iron sewer pipes and house leaders are pervious to sewer gases. In one instance in Jersey City the leader was so porous that the parlor was rendered almost uninhabitable. He recommends that all sewer pipes be thoroughly varnished with shellac or soluble glass, or else paiuted with heavy paint.

CINDERS IN THE EYE.—One of the minor trials in railway travels arises from cinders in the eye. A simple and effective cure may he found in one or two grains of flaxseed, which can he placed in the eyes without paiu. As they dissolve, glutinous substance is formed which envelops any foreign body that may be under the lid, and the whole may be easily washed out.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

FROM PLYMOUTH.—Cor. Amador *Ledger*, Feb. 16: The Alpine mill was sold last week to John Evans, who has a mine a short distance from town. It is his intention to tear down the mill and rebuild it on his own claim at a point on the creek about one mile west of town. He has about 1,300 tons of ore on the dump, which he estimates will yield from $30 to $40 per ton. Evans is an old miner and is getting along in years, after spending a fortune in mining. Some capitalists from San Francisco have been in town for the past three weeks trying to purchase the claim owned by John Cupps. Green Aden, it is reported, will commence work on his mine about the first of next month, and will bave the ore crushed at the mill of John Evans. A silver mine is reported to have been discovered a few days ago in this vicinity by Wm. Gregg.

VOLCANO.—The rock left on the dump at the time the hoisting works of the Tellurium mine was burned was crushed about two weeks ago, and yielded the handsome sum of $12 50 per ton. The same rock only paid $2 before the hoisting works were destroyed. Free gold could always be seen in the ore, and experienced miners did not understand why it did not pay better. This shows that either the mill was managed poorly or some one was getting away with the gold. A. W. Robinson and Eugene Lucot bave taken out from their claim, located on Kate Gray's gulch, about 50 tons of rock, wbich is being crushed at the Downs mill. Mr. Gillick is still taking out rock from his mine, which shows free gold in paying quantities. Brook and Griesbach had some rock crushed last week which paid $28 per ton. The mine is located on Pioneer creek, about five miles from town

MISCELLANEOUS.—Amador *Ledger*, Feb. 16: S. D. Shugert will start below shortly, principally for the purpose of arranging for the erection of a 20-stamp mill at Hunt's gulch. The hoisting works of the Jackson or Ginocchio mine are being taken down, to be moved on to the Moore mine forthwith. They are of sufficient capacity to sink 400 or 500 feet. At the Zeile considerable work has been done in the way of repairing the shaft between the 600 and 800-foot levels. This section has been thoroughly fixed, and the work of repairing at the 240 level and above will be undertaken at once. The mill is kept running steadily while this repairing is in progress. A reduced number of men have been employed of late, owing no doubt to the fact that the extraction of ore sufficient to keep the mill going requires less men than formerly. The work of reopening the old shaft at the Gover was to be let by contract last week. The shaft has collapsed considerably, and the attempt of the company to re-open it has met with indifferent success, so it has been decided to let it by contract. The contract calls for the re-opening of 70 feet altogether.

VALPARAISO.—Amador *Sentinel:* The work of prospecting the Valparaiso mine has been commenced. Four men have been put on. It is reported that a body of good rock has been struck at the St. Julian. Their mill will be started up in a few days for the purpose of crushing the same. The Moore mine engine and boilcr is being removed from the Jackson mine to the Moore. This would indicate an intention to commence active operations on the latter. Shugert & Morgan intend to erect a 20-stamp mill at the mouth of their tunnel in Hunt's gulch in the near future. They began yesterday to lay pipes for the purpose of hydraulicking off a piece of ground for a mill-site.

Butte.

PREPARING TO DRIFT AT THE CHEROKEE MINES.—Marysville *Appeal*, Feb. 13: The S. V. H. G. M. Co. of Cherokee, Butte county, are engaged in running a long bedrock tunnel preparatory to mining by the drifting process instead of hydraulicking as at present. A series of prospects has developed the fact that the pay streak in tbe mine lays in a. bed of gravel of an average depth of 12 ft next the bedrock. This pay streak is very rich, prospecting from $1.87½ to $4 to the carload. The company is satisfied that it will pay better to drift than to hydraulic. They now have a bank of 400 ft face with a hundred ft bed of pipe clay running through it. The latter is very difficult to work and contains no gold, but must be moved away through the sluices. They now employ 200 men but will increase the pay roll to about 500 men when drifting. The company, the town and the farming country below on Butte creek will all be benefited by this change in the manner of working the mine. It will require about 6 months to finish the tunnel and hydraulicking will cease entirely in that mine in a year or so.

Calaveras.

HAULING ORE.—*Mountain Echo*, Feb, 14: We understand that Fred Brunner's mine has been bonded, and the parties are at present hauling ore to the Marshall mill, near Altaville. The intention is to crush 300 tons of ore for the purpose of prospecting the mine.

THE COMET MINE AND MILL.—Calaveras *Citizen*, Feb. 14. We recently visited the Comet mine, near Donnollan's bridge, and were suprised at the great improvements made at this new mine in such a short space of time. Only a few months ago the place where the mine now is was nothing but a bare hill with quartz strewed over the surface, and here and there a prospect hole dug on its slope. Two well constructed tunnels have been excavated under the hill, on a level with the upper portion of the mill. The tunnels and mill are connected by steel rails—a great improvement on the old wooden rail—as the cars can be handled with ease and swiftness. One of the tunnels is connected with a shaft to the surface so as to enable the ore to be handled with the least possible expense and with great expediency. In fact the whole arrangement is planned admirably so that the ore can be excavated and delivered in the mill at a very small cost. In addition to the afore said tunnels, upon the side hill, are wide and deep open cuts dug to test the extent of the ore, and it looks like an open quarry of decomposed auriferous slate and quartz. The whole side hill seems to be of the same material, and not a difficult matter to see gold here and there through the mass, even with the naked eye. The mill is a 20-stamp one. The building is well arranged, strong, convenient and neat, and complete with all the modern improvements in amalgamating plates. The mill is run by water power, with one of Pelton's wheels, under 290 ft pressure. The water is brought from the Mokelumne Hill ditch, in a new ditch dug by the Comet Co., of three and a half miles in length. The water had to be brought in a pipe 2,000 ft across the Calaveras river. The depression is 380 ft of perpendicular depth, two cables support the pipe across the river. In all it took over 4,000 ft of pipe to deliver the water at the mill. The mill is now running and every thing works well. This mine will be of great benefit to San Andreas, and vicinity—as we have plenty of gold bearing rock all around us and the thing we need is capital to develop our resources.

El Dorado.

MINE BONDED.—*Mountain Democrat*, Feb. 14: H. P. McNevin, formerly superintendent of the St. Lawrence mine, this county, came up from the Bay last week, and while here bonded the Darling mine near Bear creek, in Georgetown township. McNevin is a thorough miner, and the fact that he will at once put a force of men to work, is sufficient to justify the expectation of good results from the Darling.

Inyo.

MODOC CON. MINING COMPANY.—Inyo *Independent*, Feb. 14: Mr. Frank Fitzgerald, Superintendent of the mines at Darwin, has just made the following report of operations to the secretary of the Modoc Mining Company: Have shut down furnace for want of coal. Five days run produced 62,718 pounds of bullion, value as follows, viz.: Silver, ounces per ton, 16.6; gold, per ton, $39.68; total value of bullion, $10,954.96. Will take some time to get bullion to the railroad, as teams are scarce. Resumed sinking in the South Lookout mine, average width of ledge at bottom of winze, three feet; tbe ore contains 36 per cent lead, 69 ounces silver, $12 gold per ton.

BROWN MONSTER.—A lot of ore was shipped this week from the Brown Monster mine to Selby & Co., San Francisco.

Mono.

MAMMOTH.—Bodie *Free Press*, Feb. 13: A party of 8 miners started for Mammoth the other day. They secured a team from Thomas Williams, which will proceed as far as tbe snow line, from thence snow-sboes are used. It is understood that a large stock of provisions were stored in Mammoth last fall and that a little syndicate has been formed to work quite extensively, the coming season. A little quartz mill is to be erected and ore will be taken from the Lisbon and other mines known to yield high-grade rock.

Modoc.

MORE RICH DIGGINGS.—Modoc *Independent*, Feb. 12: A gentleman who came up from Big valley a few days ago informs us that Sam Todd and some other parties are at work on a newly discovered quartz ledge in the vicinity of Stone Coal valley. A shaft has been sunk to the depth of about 14 feet and the rich quality of the rock increases as they descend. The ledge is a well defined one, the casings being of slate on one side and granite on the other. Our informant (who is possessed of considerable capital), took a good look at the rock and came to the conclusion that the mine would be a good thing to own; but after inquiring the price, he abandoned the idea of purchasing, as the amount asked was far beyond his means. The owners think they have a bonanza and say they would not exchange for the whole of Hayden Hill.

Nevada.

MILLS.—Nevada *Transcript*, Feb. 13: The foundrymen of this county will do a good business during the coming summer. The prospect is very good for a number of new hoisting works and quartz mills being erected.

CHAMPION MINE.—*Herald:* A crushing of nearly 30 tons of quartz from the Champion mine has just been completed at the Deadwood mill, and the results, we are informed, were very satisfactory. There was a large amount of sulphurets saved, which is valued at $125 per ton. All operations at the Champion have been suspended, to await the outcome of the lawsuit now pending between the Champion Co. and the Wyoming Co.

ITEMS.—Grass Valley *Union*, Feb. 14: Several tribute companies are at work in the Rocky Bar mine. The water between the fifth and sixth levels of the North Star mine is being lowered rapidly. The work of putting in a 16-inch pump down to the sixth level is progressing satisfactorily. There is the usual rumor tbat the Allison Ranch mine will be started up at no distant day, but nothing is known of a certainty. It will take more work and less talk to put the famous old mine on its feet again, but that it can be made a productive property there is no reason to doubt, in the opinion of experienced miners of the district. The Green Mountain ground on Osborn Hill has been leased by Alex. Sims to a company of working miners, wbo are putting up machinery (the same that has been standing on the Black Lead) to work the mine. The Green Mountain yielded very rich quartz for a time some 12 years ago, and paid a number of handsome dividends to tbe then owners.

THE TEXAS MINE.—*Transcript*, Feb, 13: By throwing up an embankment in the bottom of the shaft and keeping the pumps going constantly, tbe Texas Company have been able to start a drift on the ledge and are now taken out good ore, of which one of the owners says there is a thousand tons in sight. The company had not intended to drift until they got 50 or 60 feet lower than where they are, but having encountered running ground it was necessary to do something of this character to relieve the pressure. If it does not answer the purpose, the machinery will be moved 65 feet further up the hill and a new shaft will be put down.

San Bernardino.

CALICO CROPPINGS.—Calico *Print*, Feb. 15: Barber's mill has been running continually and successfully for sometime on custom ore. It is one of the most complete, best arranged and best managed silver mills on the coast, of its size. Arrangements are being made for enlarging its capacity. It is stated by an old experienced mill man, who has recently had his ore worked at this mill, that any miner who would complain of the management at Barber's mill must be a chronic grumbler and bard to please. Not only is everything done with courtesy and dispatch, but the customer is sure to get every ounce which can be got out of his ore by care, skill, experience and the most improved process. The superintendent, Mr. Sterritt, understands his business thoroughly, is every way reliable and honorable, and every employee from the assayer to the "end man" is fitted to, and trustworthy in his place. The water question is no longer a problem, but an abundant and permanent supply is secured. The rates charged are not in excess of those charged by any other mill, and its convenient location, taken in connection with all its other advantages, is such as to secure a constant supply of ore, with satisfactory results to both partners and the owners of the mill. Messrs. Osborne, Kurtz and Evans, owners of the Sue mine in West Calico, have sold to Messrs. Waterman and Porter one-half of their interests in the Sue, and it is agreed that the quartz mill at Resting Springs belonging to Mr. Osborne shall be removed to Calico district and increased to a capacity of 15 stamps, the same to be used in crushing the ore from the Sue and other mines of the company. Chloriders on the Silver quartz lode have discovered a rich vein of mineral, which is in all probability an extension of the Sue ledge. There are at present eight men working on said claim, which in the near future is likely to turn out a bonanza for the owners.

Shasta.

AROUND THE COUNTY.—Shasta *Democrat*, Feb. 14: Kempton's mill on Salt creek is running $50 rock. At the water level the ore improves. More heavy milling machinery arrived at the depot last Thursday and was freighted to Copper City. A couple of miners last week discovered another gold-bearing quartz vein on the head of Oregon gulch. Last Thursday a couple of prospectors arrived in Redding from New River. They report the new camp booming. The new gold find on Squaw creek is said, by reliable parties, to be a veritable bonanza. Conant's claims prospect amazingly. Col. Magee returned from 'Frisco last Thursday evening. He says mining men of the city are greatly excited over the mining reports from Shasta and Trinity, and a swarm of them intend to visit the two counties soon. We hear it reported, but cannot vouch for the truth of the statement, that an English company, with large capital, have become interested in the big lumber enterprise Loy & Blood have been engaged in for the past year or more on the Big Bend of Pit river. Last week a chunk of gold bullion, weighing 45¼ ounces, was shipped to the mint from the Washington mine at French Gulch, the clean-up from seven tons of ore taken from the lower level. Foul air drove the miners, for the time being, out of the tunnel, but this will soon be overcome. John Neal brought to our office last Friday samples of quartz from a ledge he discovered the day before on Oregon gulch. The rock shows well in free gold. Dale & Fife, the gentleman who bonded the Silver King mine, near Centerville, have ten men at work, instead of six, the number we reported last week. They have made quite a lively camp in a short time, and are putting down a shaft at a lively rate. The Afterthought mine at Furnaceville has been bonded for an indefinite period to A. J. Loomis, of Red Bluff, one of the principal stockholders, and he has now complete control of that property. Mr. Loomis does not intend to work the mine himself, but expects to sell or lease it to parties who are able to put up the necessary machinery to successfully work the ore, which is rich but refractory. Considerable excitement has been created by the recent discoveries on Squaw creek. Several mining experts and operators from San Francisco are now on the ground watching developments. We understand that Coonant, the discoverer, has bonded one of his claims to some Idaho parties for $50,000. The main ledge averages about six feet in width of porous white quartz, in many places showing free gold, while all the rock shows up gold in pan and spoon tests. The mines lie due north of the Windy Camp group, and are in the same feldspathic porphyry formation. Judging from samples of ore placed in our mineral cabinet, the Fair View and Red Bird claims on Salt creek are the making of splendid mines. The Fair View is the property of Mr. Kempton, and the Red Bird was located on the 19th of last January by Mrs. Rittie Kempton. A small cannon ball mill is constantly running on ore from the Fair View, and so far the ore has been averaging $50 per ton. Sufficient work has been done on the Red Bird to show that there is a large body of high grade ore in sight.

Sierra.

PROSPECTING.—Sierra *Tribune*, Feb. 14: Lindsey & Co. are prospecting a ledge with good results at Poker Flat. They have made developments sufficient to justify them in building a mill in the spring. Three hundred ounces of bullion was shipped from Howland Flat last week. The gold was taken out of the Virginia drift mine, at that place. From Poker Flat the news reaches us that Gardner & Co. took $4,000 out of the Belmont quartz claim in a very few days recently. Considerable quartz prospecting is going on around Alleghany. There are some good ledges over in that section. All that is needed is a little capital to develop them. W. H. Weldon, owner of the gold King mine, near Alleghany, is expected up from below soon. The lower tunnel at the claim is still being pushed ahead. Parties who are acquainted with the mine say that it has a fine outlook.

Trinity.

FOUND IT RICH.—*Journal*, Feb. 14: W. M. Casley, of Buliychoop, informs us that Hoskins Bros. have struck it rich in the Little Gem mine (formerly known as Rattlesnake) in that district, and that they expect to put up a 10-stamp mill in April.

LOOKING AT MINES.—Mr. Chas. T. Hoffman, a well-known mining expert from San Francisco, visited Deadwood last week with a view to investing in quartz mines in that flourishing district. He left for the city on Friday last, being highly pleased with the prospects and promising to return in a few weeks.

THE BROWN BEAR MINE, of Deadwood is one of the good things of Trinity county. Not only is it a paying property in the bands of its owners, but one which is of great benefit to the community. In conversation with Supt. Watt—who visited town in company with his wife this week—we learn that the mine directly and indirectly contributes to the support of not less than 50 people; no Chinese employed either. They have a 10-stamp mill, with Frue concentrators and sulphuret reduction works connected tberewith. There are several other mines in that district which, when properly developed and put in active operation, will be as prolific of good results as the one to wbich reference is here made. The Barted mine, belonging to McDonald Bros. & Franck, also employs many men about the 5-stamp mill and in the mine.

NEW ROUTE TO NEW RIVER.—Shasta *Democrat*, Feb. 14: A gentleman who returned from New river last week gives tbe distances from Redding to that mining district via Coffee creek as follows: From Redding to Trinity Center, 47 miles; thence to head of Coffee creek, 24 miles; thence to Cicilville, 16 miles; thence to the mouth of Plummer creek, 7 miles; thence to Mary Blaine mine, New river, 12 miles; total, 106 miles. This is said to be the best route through the mountains, the trail all the way from the mouth of Coffee creek being open and on an easy wagon-road grade. Quite a number of old prospectors and mountaineers, who know every foot of that country, say this is unquestionably the cheapest and easiest route to the new El Dorado. At Carryville good saddle horses can be hired at any time at reasonable rates. Tbe whole route leads through a mineral belt which, practically, is yet unprospected. For prospectors, at least, it is the best route. By the other route—the stage and saddle short line—it can be made in two days from Redding. Take the morning train to Delta, from which a pleasant horseback ride of four or five bours at most, over a good trail, lands the traveler in Trinity Center. The distance from the Mary Blaine mine on New river is less than seventy-five miles. This we are assured to be true by one who has traveled the mountains between the Sacramento and Salmon rivers for the last twenty years.

NEVADA.

Washoe District.

CROWN POINT.—*Enterprise*, Feb. 14: A large amount of low-grade ore is being extracted and sent to the mills on the Carson river. A considerable amount of prospecting is being done at various points for the purpose of opening out new deposits.

YELLOW JACKET.—The old upper levels still continue to yield a large amount of low-grade ore, which is sent to the mills on the Carson river for reduction. Explorations are being made in various parts of the mine.

OPHIR.—The north lateral drift on the 500 level is being advanced rapidly. It is being run along the west wall and will be continued through the Mexican and Union Consolidated ground.

GOULD AND CURRY.—The new joint station on the 1000 level of the Bonner shaft is completed, and explorations will now be made in ground never before prospected.

HALE AND NORCROSS.—Work on the 2900 is being pushed, and it is reported that the prospect of finding something rich on that level is very good,

Columbus District.

MOUNT DIABLO.—*True Fissure*, Feb. 14: The west drift on the sixth level is now in 126 feet, having advanced 16 feet during the week, and the south cross-cut from this drift is in 18 feet. The west drift on the fifth level shows a little low-grade ore in the face. The raise from the west drift on the fifth level is up 78 feet, and shows a foot of $30 ore. The drift to connect with this raise has 30 feet to go and shows some $40 ore. The stopes below the third level show no change of note, but are all turning out a little ore. The stope west of the shaft between the second and third levels, is looking very well and giving considerable $60 ore. A small amount of $80 ore is being taken from the east drift on the second level, and some ore of good grade is being taken from the west drift on the same level. The intermediates stopes, between the first and second levels, are giving a little ore of good grade. Some ore of fair grade is being taken from the first level, and a small amount of ore is being taken from the Mount Diablo adit.

Cortez District.

LOOKING WELL.—Cor. Eureka *Sentinel*, Feb. 15: A gentleman from Bullion informs me that things are looking pretty well across the valley from us about 15 miles. Steve Bidwell, lately from Silverado, near Eureka, has made an important strike near the Eagle mine about four miles north of the Lady of the Lake. The ledge is undoubtedly the one which has been searched for time and again by different parties. It is a fissure vein ten inches in width, assaying from $300 to $700 per ton. A lucky Eurekan! Still further north, near the park called Coral canyon, is a mine found last spring. It has made a shipment of ore averaging $380 per ton. Charley and John Twiss five miles east of Bullion, have a splendid body of ore in their mine. They shipped several carloads last summer. Their ore is of a high-grade quality. There are 12 men working in the Silversides at Bullion, which is producing some splendid ore. The Lady of the Lake is working steadily. The mill is running and regular shipments of bullion are made. Jim Campbell is working one of his limestone district mines, and has encountered a body of ore. I don't know how large it is, but it assays from $300 to $1,200 per ton. All those mines are on the edge of Lander county. We of Cortez are doing pretty well. Gillam Bros. & Tex are now sinking a shaft and driving their tunnel to connect. The shaft is sunk in ore, and this proves to be a fissure vein as far as seen. S. E. Ducommun has struck ten inches of splendid ore in the Silver Fleece, William Lewis is producing some good ore. Major William Earls is driving a tunnel, or, more properly speaking, is splitting the hill wide open, on account of a rich ore streak that shows itself on the surface. The Aurora has two fine bodies of ore in the lower tunnel. The ledge is stripped for 30 feet. There are 18 inches of red ruby ore going down in one place. A raise has been started from the upper tunnel to the surface, producing a high-grade of antimonial silver ore.

Eureka District.

ORE SHIPMENTS.—Eureka *Sentinel*, Feb. 14: The following ore shipments have been made to the Richmond Con. furnaces during the week ending yesterday, the first two mentioned being exceptionally rich: Lord Byron, 37 tons; Silver Lick, 52; General Lee, 20; Bowman, 9½; Oriental and Belmont, 30; Mimbres, 10. The roads being in a rather bad condition, it is natural to suppose these

shipments for a while will show a slight falling off. All the above mines are, however, said to be looking well.

THE RICHMOND CON.—Owing to the bad weather and the still worse condition of the roads during the early spring months in this section, the Richmond Con. reduction works will cease operations on the 28th instant for probably six weeks or two months. The company refuses to buy any more flux ores at present, but will continue to purchase milling ores even during the cessation of work. Over 100 men will be temporarily thrown out of employment.

THE EUREKA CON. WORKS.—*Sentinel*, Feb. 12: Work in connection with the new buildings and the new furnace at the Eureka Con. reduction works, is progressing favorably. Work on the building, wherein ores will be received, sampled and mixed is now being vigorously pushed, inasmuch as the company will not be able to receive much ore until the structure is well under way. It is believed that in the course of a week they will be able to receive ores to the extent of several thousand tons.

Grantsville District.

WORK AT GRANTSVILLE.—Walker Lake *Bulletin*, Feb. 14: The Alexander mill, at Grantsville, will soon resume work on tailings. These tailings are worth about $12 per ton, and the promoters of the enterprise expect to make a handsome profit.

Rebel Creek District.

ORE FROM THE OHIO MINE.—*Silver State*, Feb. 14: E. O. Conner's team arrived yesterday from the Ohio mine, at Rebel creek, with 100 sacks of ore for shipment to Salt Lake. The roads are so soft that 20 sacks of ore, weighing about a ton, had to be unloaded by the teamster on his way here.

Tuscarora District.

BELLE ISLE.—*Times-Review*, Feb. 13: On account of repairs at the main shaft, but little work has been done under ground the past week.

NORTH BELLE ISLE.—Drift north on the 150-foot level, has been extended 15 feet. The face of the drift shows a favorable change.

NAVAJO.—Repairs on the shaft and gallow-frame will be completed to day. The pumps will be started sometime to-morrow, and work will be resumed under ground in a few days.

INDEPENDENCE.—East cross-cut, 400 foot level, has been advanced four feet; total length, 39 feet. The rock is extremely hard. South drift, same level has been extended 27 feet; total length, 1,039 feet.

Willow Creek District.

PROMISING.—Cor. Eureka *Sentinel*, Feb. 12: Since my last communication Willow creek has made considerable advancement as a mining camp. Work on several of the claims has been prosecuted in a thorough and business-like manner with very good results. The miners are beginning to find out that dreaming and toasting their shins behind a harroom stove is a poor substitute for pluck, muscle and giant powder in opening up their claims, and the result is very gratifying. The mine, which is now attracting the most attention in this camp, and which gives the most promise of being a producer in bullion, is the Wild Deer. The ledge running north and south, has been tapped in a dozen places on the surface the entire length of the claim, 1,500 feet, and just in the center has been opened by an incline shaft, now down 130 feet. Drifts have been run north and south from the 100-foot station in the shaft, directly on the ledge, about 100 feet each way. The north drift shows rich ore nearly its entire length, the vein varying in thickness from one to four feet. The richest chute of ore is evidently pitching north, as the south drift is somewhat barren, though showing the same unbroken ledge. The best showing at present is in the incline. At a depth of 130 feet the entire face is in quartz, with from two to three feet of very rich ore on the footwall. A large number of assays, just completed from this place, gives an average of nearly $200 per ton, mostly silver, though some of the samples went as high as $75 in gold. Work is now being pushed day and night in the shaft. A tunnel has just been started on the ledge several hundred feet down the mountain, which is intended ultimately to connect with the incline, and at that point will tap the mine at a depth of 400 feet. The first contract of 200 feet has been let. One of the best claims on Willow creek is the Southern Belle, owned and worked by John Bergen, an industrious and enthusiastic prospector. Recent developments prove the existence of a strong ledge, assays from which run from $30 to $200 silver per ton. Some galena is found in this ledge, which is unusual for this district. The Ohio mine is employing about a dozen men, and has recently added an assayer to its force with a complete assay outfit, by which means a regular weekly statement of the grade of ore encountered in the various workings may be rendered. The same plan is adopted at the Wild Deer mine. Mr. John A. Kean, well known in Eureka and Secret canyon, is assayer at the Ohio.

ARIZONA.

FROM DIFFERENT DISTRICTS.—Prescott *Courier*, Feb. 14: Rich gold-bearing rock is being taken from the Sterling mine, 6 miles south of Prescott. A body of rich gold ore was recently struck in the Montgomery mine, Representative W. H. Robbins is in receipt of a letter from a friend in Alexandra, Peck district. Letter takes a hopeful view of the mines and mining in the district. Good ore is being taken out of several lodes and it is expected that a great deal of silver will soon be concentrated out of Peck tailings. Sheriff Mulvenon is in receipt of good news from Turkey creek district. Miners are sinking on their best ledges and saving the richest ores for shipment. It is stated that there will be a big camp at Del Pasco early next spring, when the mill will be set running. Placer miners of Weaver, Hassayampa, Walker, Black canyon and some other districts are, we hear, doing well. It would be a grand thing for this section if the Howell reduction works were placed in running order under some man like John Howell, who does know how to manage mines, mills, etc. With the addition of some more machinery the "works" would be so complete that nothing more would be required to work the most rebellious ores of this section. Prescott is the proper place for work of this kind.

GOOD ORE.—Mr. D. W. Clearwaters has struck very rich and handsome silver ore in a new shaft he is sinking in the Howard mine. Ore worth between $300 and $400 per ton. It can be seen at Joe Wilson's clothing store. Mr. M. L. Lawler has news from Agua Fria district to the effect that mines there are yielding plenty of rich silver ore.

A BIG BONANZA.—*Sentinel*, Feb. 14: D. M. Field, of Tacna station, came into town last Sunday. He reports the organization of a new mining district in the Cabeza Prieta Range, near Tule Wells. The district is six miles square and is known as the Cabeza Prieta mining district. The celebrated gold mine known as the "Chloride," recently taken up by D. M. Field and George Hurley, is located about the center of the district, and is said to be the richest strike ever made in this country any where. This location was an old prospect discovered about 15 years ago by a Mexican, and an assay of the ore then made gave a return of $900 to the ton in gold. J. M. Redondo, who intended to go on with the mine and work it for a certain share with the discoverer, died soon after completing arrangements. The discoverer, who having become discouraged at the death of Redondo, took sick, and he too, soon died. All this happened some 15 years ago and during all this period of time the mine has been idle, as no one knew of its exact locality. Several persons had been looking for it for weeks and months but without success. Finally the wheel of fortune turned in favor of D. M. Field and George Hurley who became the lucky finders and who feel very much elated over their splendid luck. They say they have the biggest and best mine in the United States, or perhaps, the world. This great bonanza is about 75 miles southeasterly from the Tule Wells, in this county. It is about 35 miles from Tacna, the railroad station. The ledge is 40 ft wide, and the very surface rock assays $90 to the ton. The ore is of a peculiar texture and can be worked with ordinary picks and shovels, and without blasting.

ALDER.—Houston *Press*, Feb. 14: We are under obligations to E. M. French of the Half Way house, for a number of fine specimens of ore from prospects in Alder mining district. This district is rapidly becoming prominent for the number of rich finds being made and the quality and quantity of ore uncovered. The specimens before us are from the following properties: The Superior, located between the Alice and Isabel, shows a 4 ft vein in an incline which is down 20 ft. A working shaft is being sunk which cuts a solid body of ore 18 inches thick. The returns from assays show very high grade ore carrying galena, carbonates and chlorides. The Superior is owned by Owens and Hall. The Isabel is a very promising prospect having returned assays of from 200 to 300 ounces of silver to the ton. The Pinacle, an extension of the celebrated Mammoth mine, carries both silver and copper in paying quantities. Messrs. Owens and Hall have another prospect of fair promise located several miles up the river which helps to substantiate the theory already advanced by the *Press* that the mineral belt on the west side of Big Lost River is continuous from the Lava creek district to the headwaters of Lost River. The bodies of ore uncovered in this section seem to surpass, in bulk, anything previously found in this Territory and as the majority of the finds have paying ore it is reasonable to predict a great boom on Lost River during the present year.

COLORADO.

LEADVILLE.—*Mine, Stock and Rail*, Feb. 12: Several new strikes are reported from the Adelaide. The Forest City is shipping about 60 tons of ore a day. The Denver City is continuing its shipments of low-grade ore. The Constance, on Iowa gulch, will be in good working order in a few days. The Dunkin mine shipped last month about 100 tons of ore, some first, but largely second class. The present coal supply for Leadville comes from Coal creek, Como and Gunnison; coke from El Moro. Mr. Sam Adams reports the shipment last month of about 1,200 tons of ore, of which the larger part went to Pueblo. Mr. G. Richards, owner of the Grafton, has commenced the sinking of a deep shaft on the west line of the Fairview, belonging to the Chrysolite group. Mr. Adams of South Half Moon reports that good ore is being stoped from the lower tunnel of the Crown Point mine, about 250 ft in. The Adams shaft is being sunk deeper; a depth has now been gained of 95 ft, where there is pay ore covering expenses. The Susquehanna and Iron Duke are both producing. A large body of sulphide mostly galena, of a very high grade of silver, was recently encountered in the very midst of the great Sellers ore chute. Mr. George Summers, manager of the Yankee Doodle, has let a contract to F. O. Miller and another miner for sinking the new shaft on the break of the Carbonate Hill contact vein, to the depth of 260 ft, 4½ by 8 ft in the clear. The Small Hopes Mining Co. has let the contract for sinking a new shaft on the Result, one of the claims of the company. The shaft will be commenced next Monday. The Lillian stamp mill will be completed and ready for business in a few days. Leadville sampling works have received of late sundry shipments of Aspen ore, but not much as yet. Smelters are crying for cars in hard weather. The American is running only two stacks this week. Bullion prices per ton at Leadville have averaged this week $34. Mr. J. S. C. Manville quotes bullion freight from Leadville to Missouri River points at $22. Leadville smelters still manage to smelt, notwithstanding the large shipments of ore to Pueblo. There is an advantage in their familiarity with ore resources and their presence on the spot, which is rarely taken into consideration. A good many shippers want to have their ore sampled right here, and thus avoid the loss on transit. The market for iron fluxing ore with a fair grade of silver is very dull. The output of the Lee, joined to that of others, has been so large for the last three months that the various works here and in the valley are pretty well supplied for the present. The Lee shipped about 4,000 tons during that time. The Wolf Tone will be shipping ore within a week. A station is now being built at the depth of 685 ft, where there is a body of carbonates averaging 30 per cent of lead. The Little Pittsburg Mining Co. has at last effected the damage of Little Pittsburg No. 6 and an increased output may be expected. The present output goes to the Harrison. The Denver City paid well in January. Among its shipments were sundry lots milling from 50 to 70 ounces of silver.

GENERAL NOTES.—Georgetown *Courier*, Feb. 14: Much development work is being done by contract on the Albro mine, at Dumont. The lessees on the Centennial mine took out 15 tons of ore last week. It returned them, net $32.45 per ton. The lessees on the Lucky-Hesperus, Democrat mountain, have nearly 4 inches of mineral in the stope above the second level. About 10 tons of ore were shipped a few days ago from the Seven-Thirty. The ore ran from 125 to 300 ounces silver per ton. The Humboldt mine in Caseade district is producing some excellent ore, a recent millrun from which returning $700 per ton. Idaho Springs will have another sampling works, which will be built just above town by the owners of the Idaho sampling works. John Frazier is working the Watts load on Democrat mountain, and has nearly 4 inches of ore. He had a millrun last Saturday which returned him over $400 to the ton.

IDAHO.

THE RED ELEPHANT.—Wood River *Times*, Feb. 12: M. T. Richardson, owner of the Red Elephant group of mines, of Bullion, was in town yesterday, selling a small trial lot of ore which was extracted from the 140-foot level. The lot weighed seven and a quarter tons, assayed 151 ounces silver and 53 per cent lead, and sold for $1,024. The cost of mining, sampling, etc., having been only $394, the net profit on this trial lot was $630. This was not selected ore, by any means. Mr. Richardson wishing to get an idea of the real value of the ore, just had a lot knocked down, which was simply cleaned a little, sacked and shipped. The vein is five inches wide, of solid galena that requires no "sorting," as it breaks clean. This shipment proves that the ore gets better in depth, as the shipments heretofore only averaged 90 ounces, and Mr. Richardson is confident that in a short time he will be able to show a mine.

SHUT DOWN.—The last day of January the miners working in the Vienna and Mountain King mines, at Vienna, were notified that on and after the first of February the rate of wages would be only $3 50 per day, instead of $4 as heretofore. The majority of them at once indicated their intention to quit work, whereupon the foreman, George Franeey, at once left for the railway and Salt Lake, to hire other men. He was soon followed by about 60 of the boys about 40 of whom have already arrived at Ketchum or Hailey, while some have gone on to Salt Lake to notify the Utah boys of the condition of affairs. Of the 40, over 20 are stopping at Baxter's, Ketchum. They state that the mill has shut down, and only about 20 men have continued working at the reduced rate.

TERRITORIAL NOTES.—Ketchum *Keystone*, Feb. 14: Several lots of silver have been shipped from the Horn Silver mine, Lava creek, near the Blackfoot road, the average of which per ton was $780. The mine was discovered in June last. J. P. Underwood, writes that the mines in Lava district, which have been worked, are all looking splendid this winter. The ore recently worked from the Oro Fino by Scales and Wagner, milled about $240 per ton. Mr. McMahon is taking out more of the same kind. News comes of a four-foot strike of high-grade ore on the McLellan, a claim adjoining the Mayflower mine, at Bullion. The Caldwell *Tribune* says the placer mining companies are getting ready for spring work. It is expected that the Snake river placers will produce more gold the coming season than for two or three years past. The new style riffle and the burlaps are a success.

MONTANA.

WILD BILL.—Butte *Miner*, Feb. 14: The Wild Bill continues to improve as further development progresses. The new body of ore reported struck two weeks since, has opened out from four feet to fifteen feet in width, and no further wall found as yet. The men are working in the stopes, and continue raising valuable ore, which goes 26 ounces in silver and from 20 to 30 per cent in copper. Mr. Jere Roach, who owned a half interest, has sold it for $20,000. His interest was under bond, and was taken without a question as to the value of the mine. The property can be rebonded to-day for $125,000.

THE GREY EAGLE, owned by Dennis Leary, and now under bond for $10,000 to Quinn & Fletcher, is planning out well. The bondors are also the lessees for a term of 18 months. At a depth of 50 feet the workmen will begin cross-cutting to catch the main vein, and expect to get it, in a run of 16 feet. This vein, on top, shows 11 per cent of copper and 20 in silver. The ore in last strata crossed has not been assayed. Another new strike is reported in the Neptune mine. Some of the ore is on exhibition, and appears to be loaded with native and wire silver.

THE ROCK ISLAND.—Since the *Miner's* last report a cross-cut has been run from the main shaft at the 160 foot level, a distance of 14 feet south, where a large body of rich ore was encountered. A level was started and run 15 feet west, when another cross-cut was run for 12 feet into the main ore body, which is all very rich, the whole face going 56 ounces. The workmen will continue to work in those connections, which will facilitate the extraction of large bodies of ore. The promises of the mine are far better than ever before. The shots in the Lexington mine are distinctly heard in the levels of the Rock Island, and the fact of the main vein of both mines being one, and the same is established beyond dispute.

FROM GLENDALE.—In the Hecla mines work is going on day and night with a large force, and shipping 50 tons of first-class ore daily. Aside from this, from 50 to 75 tons of second-class ore is hoisted daily, preparatory to the starting up of the concentrator. The Co. has a large amount of second-class ore ready for work during the coming summer. The bodies of ore in the mines are looking well. The works are entirely under shed, and hence the storms do not effect the workmen in the least.

A RICH STRIKE.—About a week ago a very rich strike was made in the Amy-Silversmith on the 100-foot east level, at a point about 50 feet from the shaft. The vein in the face of the drift is 14 inches wide, and surpasses in richness anything ever before seen in the claim.

NEW MEXICO.

ORGAN.—Cor. Rio. Grande *Republican*, Feb. 14: Several more men have been put to work on the Jay Gould, and the timbers for the whip to be erected at once are on the way. Sam Hughes, has taken out some very fine ore, and the Urquhart Bros, are also taking out good ore, and it all comes from the Little Buck. The outlook for Organ is splendid, and she will be far more flourishing this summer than ever before. Several properties will be worked, which have heretofore lain idle, and the smelter in full blast with plenty of money to settle all indebtedness which may accrue. Messrs. Joblin, Cunningham and Roney, came out Wednesday, and we understand that everything has been settled amicably in regard to the Memphis and smelter troubles. Capt. Jesse Young, has taken a three months lease on the Silver Star from Mr. Perkins.

FLEMING AND BLACK HAWK.—Silver City *Enterprise*, Feb. 13: During my trip around the mining camps surrounding Silver City I have invariably heard a general complaint that the mines of this section are not holding their own, etc. This may appear so to those who will not take the trouble to give the matter the necessary thought, but to others it is altogether different. Our mines are far in advance compared to this time last year, and have found some very surprising facts staring me in the face during my late visit. The Black Hawk mine at Bullard's Peak deserves especial mention, and the body of ore now exposed at the eight level has to all appearances the staying qualities which veins of that character and depth usually show. Other properties in that camp will be brought out during the coming summer and the future of Black Hawk is assured. About two years ago I visited Fleming, which at that time had not as much as a tent to show that here in such a short time a flourishing camp was to be located. Imagine how the dullness(?) of New Mexico's mining industry struck me when I found some two or three dozen comfortable dwellings and half a dozen business houses erected, the hills fairly torn asunder and miners now down 100 ft or more taking out the rich metals for which this country is noted. The first plant of steam hoisting machinery is now fast approaching completion, and this is what Flemingites call the beginning of a long siege of successful mining. If these are considered hard times in mining, then New Mexico miners must surely have had a bounteous season in the past. I have had several warm arguments with some of the best miners and prospectors in this section, and although the boys spoke very discouragingly, I have invariably convinced them that they had no grounds for complaint.

OREGON.

GENERAL NOTES.—Jacksonville *Times*, Feb. 14: Most of the miners have enough water to do some work. Promising quartz has been found on J. M. Smith's premises in town. Wagner creek is developing into a mining camp. Several parties are doing well there. John Miller's hydraulic mines on Farmer's flat are being operated successfully. Considerable mining is now being done on Forest, Poorman's and Jackson creeks. The rains of the past week have aided the miners materially and it will not take a great deal more to ensure a good season for them. G. B. Caldwell & Son are running a ditch to their mines in the Steamboat district and expect to commence piping before many weeks. Jos. Goldsworthy of Foot's creek informs us that not a great deal of work has been done there as yet, but a good season is anticipated. Jos. and Capt. Saltmarsh of Sterlingville were in town yesterday and inform us that they have been unable to mine any so far. However, that is one of the dryest districts in the county. Parties are prospecting on G. H. Lynch's place in the Wagner creek district; also further up the creek. They report favorable developments, the only drawback being the depth to the bedrock. Ex-Sheriff Bybee returned from Josephine county this week and informs us that the miners of that section have a considerable water supply and expect to make a good report this season. A correspondent writes us that John Lewman of Applegate says he recently made a new strike on the ledge at Brushy gulch. The quartz is very rich, showing free gold. Prominent assayers say that it will yield from $75 to $100 per ton.

UTAH.

PARK NOTES.—*Record*, Feb. 14: A force of men are at work on the claims of the Park City Company, doing assessment work. Mr. John Farrish has been driving a tunnel on one of his claims up Nigger gulch. The tunnel is in a distance of 50 feet. Mr. Farrish has a group of claims in that locality, and expects that he will be able to make a good showing on them as soon as he attains depth. The report of a new strike in the Crescent property is denied by Mr. E. P. Ferry, who states that nothing unusal has been opened up there. He says that every day sees new ore bodies of greater or less extent opened up and that the mines are steadily improving. Mr. L. Cieutat who is working the Star on Treasure Hill, brought us in a very fine specimen of carbonate this week. This ore is a very high grade, and is the finest we seen from that locality. Mr. Cieutat deserves to strike it rich on his claim as he has kept at work on it whenever he had a spare moment. Mr. D. F. Condon, presented this office with a fine specimen of ore from the Creole and he expects from the showing to be able to make the Creole one of the shippers of the camp in the spring.

SILVER REEF.—Southern Utah *Times*, Feb. 14: Two mills, one of a five and the other a ten stamp mill, are steadily engaged in crushing the ore extracted from the mines of the Christy and Stormont. About 300 men are employed at the mines in the Reef. Wages are down to $2.50 and $3. A solid and substantial basis, but not gilt-edged.

REVIEW.—Salt Lake *Tribune*, Feb. 13: The week has been a stormy one, with more snow in this valley than before in twelve years. The receipts of bullion and ore in this city for the week ending February 11th, inclusive, were: Of bullion, $75,-799.55; of ore, $12,143.92; total, $87,943.47. The week previous the receipts were $99,942.87 in bullion and $22,458.44 in ore. The Horn Silver continues to pile up its product at the smelter. The Ontario shipped during the week fifty-three bars of bullion, assaying $38,310.28, bringing the total product of the year up to $197,865.87. The Christy sent up from Silver Reef two bars of silver ($2,890), and the Stormont two bars ($2,200); a total of $5,090 from that district. The product of the Germania smelter for the week was ten cars of bullion, $22,139.27. Two gold bars were received on the 7th, valued at $2,500.

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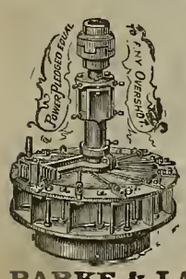

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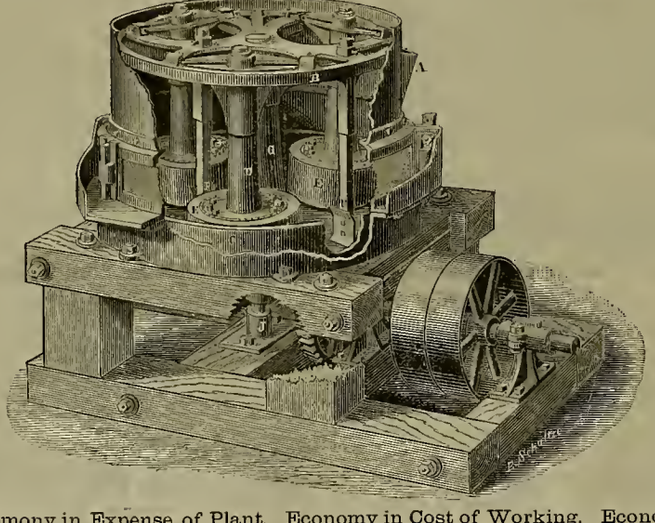

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Mining Legislation.

The bill to pay the claims for building the debris impounding dams on the Yuha and Bear rivers has passed the Assembly, and now goes to the Senate.

The Cross bill, concerning mining dams, which we gave in full last week, has been favorably recommended by the committee.

A bill has been introduced by M. S. Torrey to compel individuals, companies or corporations owning or controlling water for the purpose of mining or irrigation, to distribute the water pro rata among the purchasers in times of scarcity or drought. The provisions are as follows:

SECTION 1. Any corporation, company or individual owning, controlling or holding the possession of the water flowing in any ditch, canal, pipe or flume, who rents, sells or distributes the water therein for purposes of mining or irrigation, in times of scarcity or drought, or when there is not a sufficiency of water in such ditch, canal, pipe or flume to mete out to such purchaser the full amount of water purchased by him, shall distribute, or cause to be distributed to each purchaser his due pro rata of the water flowing in such ditch, pipe, canal or flume; *provided*, such purchaser shall satisfy such individual, company or corporation owning, controlling or possessing water, as in this Act mentioned and specified, for the payment of the water that may be distributed to any such purchaser.

SEC. 2. Any person injured on account of a non-compliance with any of the provisions or requirements of this Act shall recover by process of law from such possessor, individual, company or corporation such amount of money, as damage, sufficient and necessary to cover all loss, damage or injury sustained by him.

SEC. 3. This Act shall take and he in full force and effect from and after its passage.

Mining Share Market.

About all the business being done in the stock market is confined to the middle Comstock mines, and there is not very much in them. Should the crosscuts soon to be run on the 2900 level show an abundance of pay ore, the effect on the market can easily be conjectured. Both Chollar and Hale and Norcross stocks are strongly held at this interesting junction. While all the other Comstocks are as dull and depressed as they can well be, the *Enterprise* thinks that there will surely be a revival and some rapid advances in them if the new level of Hale and Norcross turns out successfully. From this time forward the middle stocks will be more interesting to operators and dealers, and lively fluctuations are expected in them while the work of exploring the new levels progresses.

At Gold Hill they are running things in the usual manner and taking out considerable low-grade ore from the Crown Point and from the upper levels of the Yellow Jacket. The Belcher is also doing the usual amount of work and sending a large amount of low-grade ores to the mills.

Bullion Shipments.

Alhambra Mill, February 15, $13,198; Barber's Mill, 15, $3,276; Moulton, 3, $20,416; Old Lexington, 5, $1,456; Alice, 4, $25,132; Lexington, 6, $23,600; Alice, 6, $12,928; Vienna, 10, $3,900; Minnie Moore, 10, $4,380; Germania, 11, $22,139; Wood River ore, 10, $973; Nevada ore, 12, $3,200; Vienna, 12, $1,860; Ontario, 12, $24,162; Crescent, 13, $4,400; Germania, 13, $10,880; Christy, 13, $1,500; Minnie Moore, 13, $1,070; Vienna, 14, $1,990; Stormont, 15, $3,352.

The banks of Salt Lake report the receipt for the week ending February 11th, inclusive, of $75,799.55 in bullion and $12,143.92 in ore. There were shipped from Salt Lake during the week ending February 14th, 21 carloads of ore, 611,286 pounds; 19 cars bullion, 433,629 pounds; making a total of 41 cars, aggregating 1,044 915 pounds.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, department 10, San Francisco:

GOVERNOR MORTONS M. Co., Feb. 17,—Capital stock $1,000,000. Directors—L. A. Booth, W. H. Brown, H. F. Cooper, W. Carson and B. J. Watson.

HUNT AUTOMATIC LOOM CO., Feb. 14—Capital stock $1,000,000. Directors—R. H. Hunt, G. Wihl, George Stevens, F. A. Will and J. B Reinstein.

FOR ARIZONA AND N. M.—Mr. Frank W. Smith will shortly travel as our representative for the MINING AND SCIENTIFIC PRESS, through Arizona and New Mexico, stopping on the way at Calico and other southern California mining districts. Mr. Smith will forward for the PRESS descriptions of the country he is to visit and will pay more particular attention to the mining interests, describing the mines, mills, smelters, etc., in the regions in question. We bespeak for Mr. Smith a cordial reception, and hope that those whom he meets will give him such reliable information as is in their possession. His letters will be of interest, as he is familiar with mining matters and will gather such items of information as will be useful to our readers and will be of benefit to the mining industry.

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ASSESSMENTS.

COMPANY.	LOCA	N.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alpha Con M Co.	Nevada.	19.	50.	Jan 20.	Feb 26.	Mar 21.		W Willis	309 Montgomery st
Acme M and M Co.	California.	8.	12.	Jan 14.	Feb 20.	Mar 13		J M Buffington	309 California st
Arnold M Co.	Arizona.	1	100.	Mar 3.	Feb 7.	Mar 2.		J Union	320 Sansome st
Belmont M Co.	Nevada.	39.	15.	Feb 11.	Mar 21.	Apr 13		J W Pew	310 Pine st
Black Bear M Co.	California.	2.	25	Dec 20.	Feb 20.	Mar 17.		W L Oliver	328 Montgomery st
Bulwer Con M Co	California.	1.	20.	Jan 13.	Feb 24.	Mar 31.		W Willis	309 Montgomery st
Butte Creek H M Co.	California.	11.	10.	Jan 30.	Mar 9.	Mar 31.		R L Taylor	230 Montgomery st
Buena Santa M Co.	Mexico.	8.	25.	Jan 22.	Feb 27.	Mar 29.		W L Oliver	328 Montgomery st
Champion G M Co.	California.	18.	10.	Jan 28.	Mar 6.	Mar 26.		T Wetzel	522 Montgomery st
Caledonia M Co.	Dakota.	15.	15	Jan 27.	Mar 9.	Apr 6.		W L Oliver	328 Montgomery st
Con Virginia and California	Nevada.	2.	20.	Jan 15.	Feb 20.	Mar 21.		A W Havens	309 Montgomery st
Eintracht Gravel M Co.	California.	17.	05.	Dec 9.	Mar 3.	Mar 21.		H Knutz	209 Sansome st
Exchequer M Co.	Nevada.	21.	20.	Jan 2.	Mar 3.	Mar 23.		G C Elliott	309 Montgomery st
Golconda M Co.	California.	1.	05.	Feb 7.	Mar 12.	Mar 31.		J M Buffington	309 California st
Hazard G M Co.	California.	6.	05.	Jan 21.	Feb 23.	Mar 23.		J T McGeoghegan	318 Pine st
Homeward Bound Pl M Co.	California.	3.	15.	Feb 21.	Mar 12.	Apr 6.		D A Smith	209 Post st
Independence M Co.	Nevada.	14.	13.	Jan 21.	Mar 2.	Mar 30.		J W Pew	310 Pine st
Martin White M Co	Nevada.	19.	25.	Jan 15.	Feb 25.	Mar 25.		J Scoville	309 Montgomery st
Mammoth Bar M Co.	California.	7.	10.	Jan 19.	Feb 20.	Mar 13.		J W Pew	310 Pine st
Mayflow r Gravel M Co.	California.	28.	10.	Jan 20.	Feb 27.	Mar 20.		J Morizio	328 Montgomery st
North Gould & Curry M Co.	Nevada.	8.	65.	Jan 12.	Feb 13.	Mar 2.		C H Mason	331 Montgomery st
Ophir M Co.	Nevada.	49.	50.	Feb 18.	Mar 24.	Apr 13.		E B Holmes	309 Montgomery st
Peer M Co.	Arizona.	2.	50.	Jan 14.	Feb 19.	Mar 16.		A Waterman	309 Montgomery st
Peerless M Co.	Arizona.	3.	50.	Jan 14.	Feb 18.	Mar 14.		A Waterman	309 Montgomery st
Potosi M Co.	Nevada.	17.	25.	Jan 27.	Mar 2.	Mar 24.		C L McCoy	309 Montgomery st
Savage M Co.	Nevada.	62.	50.	Feb 2.	Mar 6.	Mar 26.		E B Holmes	309 Montgomery st
Silver Hill M Co.	Nevada.	21.	15.	Jan 9.	Feb 13.	Mar 6.		W E Dean	309 Montgomery st
Sierra Nevada M Co	Nevada.	81.	25.	Feb 18.	Mar 25.	Apr 14.		E S Parker	309 Montgomery st
Union Con M Co.	Nevada.	29.	25.	Feb 16.	Mar 24.	Apr 14.		J M Buffington	309 California st
Utah S M Co.	Nevada.	52.	50.	Dec 19.	Jan 28.	Feb 14.		G C Pratt	309 Montgomery st
Virginia Creek Gravel Co.	California.	1.	20.	Dec 20.	Jan 25.	Mar 2.		J M Quay	406 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Excelsior Water and M Co.	California.	W J Stewart	215 Sansome st	Special	Feb 20
North Peer M Co.	Arizona.	H Deas	309 Montgomery st	Annual	Feb 27

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co.	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co.	California.	B L Burling	328 Montgomery st	50	Dec 5
Contention Con M Co.	Arizona.	D C Bates	309 Montgomery st	25	Dec 15
Derbec Blue Gravel M Co.	California.	T Wetzel	522 Montgomery st	10	Oct 8
Jackson M Co.	California.	D C Bates	309 Montgomery st	10	Dec 27
Kossnth M Co.	Nevada.	C K Sturtevant	328 Montgomery st	06	Mar 16
Navajo M Co	Nevada.	J W Pew	310 Pine st	25	Feb 15
Paradise Valley M Co.	Nevada.	W Letts Oliver	328 Montgomery st	10	Nov 28
Silver King M Co.	Arizona.	J Nash	328 Montgomery st	25	Feb 16
Syndicate M Co.	California.	J Stadfeldt	419 California st	10	Nov 6

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE.	Portland.				Red Bluff.				Sacramento.				S. Francisco.				Los Angeles				San Diego.			
Feb 12-Feb 18	Rain.	Temp.	Wind.	Weather.	Rain.	Temp.	Wind.	Weather.	Rain.	Temp	Wind	Weather.	Rain.	Temp.	Wind.	Weather.	Rain.	Temp.	Wind.	Weather.	Rain.	Temp.	Wind	Weather.
Thursday	.00	47	S	Cy.	.00	60	N	Cl.	.00	57	NW	Cl.	.00	61	NW	Cl.	.00	67	SE	Cl.	.00	61	W	Cl.
Friday	.15	53	W	Cy.	.00	60	N	Cy.	.00	55	SE	Cl	.00	57	N E	Cl	.00	67	S	Fr.	.00	63	W	Cl
Saturday	.26	45	S W	LR.	.00	62	N	Cl.	.00	57	NW	Cl.	.00	55	SE	Cy.	.00	64	S E	Cl	.00	62	N	Cy.
Sunday	.03	55	S W	Cy.	.00	64	N	Cl.	.00	59	SE	Cl	.00	61	SE	Cl.	.00	68	S W	Cl	.00	61	W	Cl.
Monday	.15	49	C	Cl.	.00	60	E	Cl.	.00	56	NW	Cl.	.00	53	W	Cl.	.00	68	S W	Cl.	.00	58	W	Cl.
Tuesday	.03	48	NW	LR.	.00	56	E	Fr.	.00	58	S	Cl.	.00	54	SE	Cy.	.00	56	SE	Cy.	.00	58	NW	Fr.
Wednesday	86	48	S	Cy.	.15	54	S W	LR	.00	57	S W	Cy.	.01	51	SE	LR	.00	57	SE	Fr.	.00	60	W	Fr.
Totals	1.48				.15				.00				.01				.00				00			

EXPLANATION.—Cl, for clear; Cy, cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature wind and weather at 12:00 M. (Pacific Standard time), with amount of rainfall in the preceding 24 hours.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Jan. 29.		WEEK ENDING Feb. 5.		WEEK ENDING Feb. 12.		WEEK ENDING Feb. 19.	
Alpha	.10	.15	....	....	....	....	....	.20
Alta	.25	.30	.27	.30	.25	.30	.30	.40
Andes	....	.10	....	....	....	.10	....	....
Argenta	....	....	....	....	....	....	....	....
Belcher	....	.80	.75	.80	....	....	....	....
Belding	....	....	....	....	....	....	....	....
Best & Belcher	.70	.90	....	.75	.70	.80	.70	.75
Bullion	....	.10	.15	.25	.20	.25	....	.25
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	.15	....	....	....	....	....	....
Bodie Con	1.90	1.95	1.90	2.00	1.85	2.15	1.95	2.05
Benton	....	.05	....	.05	....	.05	.05	.10
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	....	.05	....	.10	....	.05	.05	.30
California	....	.10	....	.10	....	.10	.10	.30
Challenge	....	.15	....	.15	....	.15	....	....
Champion	....	....	....	....	....	....	....	....
Chollar	1.15	1.45	1.45	2.75	2.00	2.65	2.60	3.00
Confidence	....	....	....	....	....	....	....	....
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.10	.15	....	.10	....	.10	.10	.30
Con. Pacific	.75	.80	....	....	.75	.75	.70	.85
Crown Point	.80	.85	....	.80	.80	.85	....	.85
Day	....	....	....	....	....	....	....	....
Eureka Con	2.25	2.75	2.50	2.75	....	....	....	2.75
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	....	....	.22	.25	....	....	....	....
Grand Prize	.30	....	....	....	....	....	....	....
Gould & Curry	.65	.70	.60	.90	.65	.70	.60	.65
Goodsbaw	....	.05	....	....	....	....	....	....
Hale & Norcross	2.60	3.95	2.85	4.00	3.40	4.05	3.65	4.35
Holmes	....	4.65	....	....	4.70	5.00	4 50	4.60
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	....	....	....	.13	....	....	....	....
Martin White	....	....	....	....	....	....	.15	.45
Mono	1.05	1.20	1.05	1.15	1.00	1.70	1.25	1.35
Mexican	.30	.40	.35	.38	....	.30	.25	.30
Mt. Diablo	....	....	3.50	3.75	....	3.50	....	....
Northern Belle	....	....	....	....	....	....	....	....
Navajo	1.60	1.70	1.40	1.65	1.30	1.40	1.00	1.40
North Belle Isle	....	....	....	.15	....	.15	....	.15
Occidental	.75	.80	....	1.00	.75	.80	....	.85
Ophir	.35	.40	....	.35	.30	.35	....	.30
Overman	....	....	.08	.10	.20	.30	....	.20
Potosi	.40	.50	.50	.85	.65	.80	.75	.90
Pinal Con	....	....	....	....	....	....	....	....
Savage	.80	1.10	.85	1.05	.90	1.00	.90	1.00
Seg. Belcher	....	....	....	....	.75	1.10	....	1.25
Sierra Nevada	.40	.50	.35	.45	.35	.45	....	.30
Silver Hill	....	....	....	....	....	.10	....	.10
Silver King	3.50	4.00	....	3.25	....	....	....	....
Scorpion	.10	.15	.10	.11	....	....	....	.10
Syndicate	....	.45	.35	.40	....	.40	....	.40
Toga	....	....	....	....	....	....	....	....
Union Con	.35	.45	.35	.40	.35	.40	.25	.35
Utah	....	....	.20	.55	....	....	.45	.55
Yellow Jacket	....	....	....	1.20	1.25	1.20	1.25	1.30	1.25

THE BLIND.—The Assembly hill to appropriate $80,000 to establish a home for the adult blind, where they can be usefully employed, has also passed the Senate, amended, however, to make the appropriation $40,000. This amount will do for a starter, but will not admit of venturing upon the erection of a large building. Still, it is a beginning, as the people will see the advantage of the institution. No doubt it will receive donations from individuals and the State.

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Feb. 19.

250 Bodie Con.....2.00
300 B. & Belcher.....50@55c
100 Belcher.....70c
850 Chollar.....2.50@2.60
700 Con Va & Cal.....25c
100 Crown Point.....75c
200 Con. Pacific.....95c
200 Gould & Curry.....50c
610 Hale & Nor.....3.70@3.75
5 Kentuck.....50c
50 Mexican.....20c
1300 Mono.....1.50
50 Navajo.....1.05
100 Overman.....15c
100 Ophir.....15c
100 Potosi.....75c
375 Sierra Nevada.....15c@20c
400 Savage.....90c
100 Union Con.....20c

AFTERNOON SESSION.

600 Alta.....30c
200 Benton.....05c
400 Bulwer.....05c
200 Chollar.....2.60@2.65
137 Con Va & Cal.....10c
80 Con. Pacific.....70c
100 Eureka Con.....2.75
530 Hale & Nor.....3.65@3.70
100 Mono.....1.35
100 Mexican.....30c
650 Martin White.....15c
400 Sierra Nevada.....30c
1100 Savage.....90c
50 Utah.....55c

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Feb. 19, 1885.

ANTIMONY—Per pound		@ —
Hallet's	12½	@ —
Cookson's	13	@ —
BORAX—Refined	7	@ 8½
IRON—Glengarnock ton	23 00	@ —
Eglinton, ton	22 00	@ —
American Soft, ton	21 00	@ —
Oregon Pig, ton	—	@ —
Clipper Gap, Nos. 1 to 4	25 00	@ 30 00
Clay Lane White	26 00	@ —
Shotts, No. 1	26 00	@ —
Schisel Bar	3	@ —
Boiler, 1 to 4	5 00	@ 5 50
STEEL—English, lb	16	@ 25
Black Diamond, ordinary sizes	13	@ —
Plow	6	@ 8
Machinery	10	@ 12
COPPER—		
Brazers' sizes	—	@ 25
Fire-box sheets	28	@ —
Bolt	22	@ —
Yellow Metal	14	@ 15
LEAD—Pig	3½	@ 3¾
Bar	5	@ —
Pipe	7	@ —
Sheet	8	@ —
Shot, discount 10% on 500 bag Drop, ₱ bag	1 85	@ —
Buck, ₱ bag	2 05	@ -
Chilled, do	2 25	@ —
TIN PLATES—Oldcastle	5 25	@ 6 00
Charcoal	5 75	@ 6 50
Coke	5 25	@ 5 50
Roofing	6 25	@13 50
ZINC—German	9	@ 10
Sheet, 7x3 ft, 7 to 10 lb, less the cask	9	@ 10
QUICKSILVER—By the flask	33 50	
Flasks, new	1 05	@ —
Flasks, old	85	@ —
NEW YORK PRICES—		
California Borax, refined	—	@ 8½
Pig Iron, American No. 1	18 00	@18 50
Pig Iron, American No. 2	17 00	@17 50
Quicksilver	47	@ 48
Lead	3 62½	@ 3 75
Copper	—	@ 11½
Tin	11½	@ —
Bar Silver	1 07	@ —

THE new mill at Kinkead, on the line of the Carson and Colorado Railroad, is running on ore from the Moss mine. A bar of gold bullion valued at $4,000 was shipped from there last week, the result of the first clean-up.

Market Reports.

Lumber at Wholesale.

There is a fair demand for lumber, but no special changes in price. Quotations of cargo rates are as follows for redwood lumber, for delivery at San Francisco, Oakland, Alameda, Berkeley, Vallejo, Benicia, Port Costa, Martinez and Antioch:

ROUGH—No. 1 rough merchantable, $18; No. 2 (refuse) rough, $14; No. 1 rough boards (specified width, 10 inches and over), $19; No. 2 (refuse) do do do, $14; No. 1 rough lumber, surface one side, $21; No. 2 (refuse) do do do $18.

PICKETS—Rough square pickets, $12; rough pointed do, $14; fancy pointed do, $22.

HALF-INCH LUMBER—No. 1 ½-inch surfaced, board measure, $40; No. 2 do do do, $39; No. 3 do do do, $38; No. 4 (refuse) do do do, $32; No. 1 ½-inch battens, board measure, $40; No. 2 (refuse) do do do, $32; No. 1 ½-inch siding, 12 ft. and over, b m, $40; No. 2 (refuse) do do do $32; ½-inch siding, under 12 ft, $32.

RUSTIC No. 1 Rustic, 1x10, 12 ft and over, $33; No. 2 do do do, $32; No. 3 do do do, $31; No. 4 Rustic, 1x10, $28; No. 5 (refuse) do do do, $21; No. 1 Rustic, 1x8, 12 ft and over, $31; No. 2 do do do, $30; No. 3 do do do, $29; No. 4 Rustic, 1x8, $26; No. 5 refuse) do do do, $21.

CLEAR - No. 1 surfaced and rough clear, $32; No. 2 do do do, $31; No. 3 do do do, $30; No. 4 (refuse) do do do, $24; No. 1 surfaced and rough clear, 1x8 and 1x6, $30; No. 2, do do do, $29; No. 3 do do do, $28; No. 4 (refuse) do do do, $24.

[Dimensioned, Surfaced and Rough Clear (widths and lengths), 12 inches wide and over, add $1 ₱ M (on each corresponding grade) to the above list price of "Clear."]

TONGUED AND GROOVED—No. 1 T and G, 1x4, 12 feet and over, $32; No. 2 (refuse) do do do, $24; No. 1 T and G, 1x6, 12 ft and over, $30; No. 2 (refuse) do do do, $24; T and G, 1x6, 7 to 11 ft, $26; do do, under 7 ft, $23.

TONGUED, GROOVED AND BEADED—No. 1 T, G and Beaded, 1x4, 1¼x4 and 1¼x6, 12 ft and over, $32; No. 2 (refuse) do do do, $24; T, G and Beaded, 1x4, 1¼x4 and 1x0, 7 to 11 ft, $27; do do, under 7 ft, $22.

ROUGH CLEAR—1x6 and under in width, and under 12 ft in length, $24.

[On a credit of 60 days, or a discount at the rate of 1 per cent per month for anticipated payments, and not less than 1 per cent per month added for extension of the same].

We quote cargo rates Pine—Merchantable Rough, $15 ₱ M; Flooring, $24.20; Stepping, $37 ₱ M; Redwood—Merchantable Rough, $18; Surfaced, $32; Rough Clear, $32; Rustic, $33; Tongued and Grooved, $30; Tongued, Grooved and Beaded, $32.

Lumber at Retail.

Retail quotations for pine, fir and spruce are as follows:

ROUGH MERCHANTABLE—(Ordinary sizes) to 40 feet long, per M ft, $22.50; Rough Merchantable, 1x6, Fencing, $22.50; do do, 1x4, do, $23.50; do do, 1x3, do, $24.50; do do, 1x4, odd lengths, $22.50; do do, 1x6, do $21.50; do No. 2, all sizes, $18.50; do Selected, $26.50; do Clear, other than for T and G and Stepping, $31.

[Rough Clear for T and G and Stepping $1 ₱ M less than price of kind for which intended.]

Dressed T and G Flooring, 1x6, No. 1, vertical grain, ₱ M ft, $33.50; Dressed T and G Flooring, 1x6, No. 1, $33.50; do do do, No. 2, $28.50; Dressed T and G Flooring, 1x3, 1x4, 1¼x4 and over, No. 1, vertical grain, $40.50; do do do, No. 1, $35.50; do do do, No. 2, $29.50; Dressed Stepping, No. 1, vertical grain, $42.50; do do do, No. 1, $37.50; do do do, No. 2, $28.50.

SPRUCE—Rough Merchantable, ₱ M ft, $21.50; do Clear, $35; Clear Dressed (shelving), $40; Pickets (rough) board measure, $20.50; Furring, 1x2, per lineal ft, 1c; Laths, 1 and 1-¼inch, ₱ M, $3.50; 1½-inch, $4.

[N. B.—For all sizes over 14 inches, and lengths over 40 feet, extra rates].

Retail quotations of Redwood are as follows:

ROUGH MERCHANTABLE—₱ M ft, $22.50; do Selected, $27.50; do No. 2, $18.50; Surface, No. 1 and Rough Clear, $40; do, 1x6, $37.50; do, No. 2, $30; Rustic, No. 1, 1x8, $37.50; do, No. 1, 1x10, $40; do, No. 2, $35; do, under 10ft, $35; T and G Redwood, 1x4, 1¼x4 and 1¼x6, $40; do do, 6-inch, 12 ft and over, $37.50; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; do do do, No. 2 $30; do do, Beaded, 12 ft and over, $40; do do do, 7 to 11 ft, $32.50; do do do, under 7 ft, $30; Half inch Surface, $52.50; Pickets, Fancy, $30; do, Rough, pointed, $20; do do, square, $17.50; Siding, ½-inch, $27.50; Battens, ¾-inch, per lineal ft, 1c; Shingles, ₱ M, $2.50; Shakes, Split, $15; do, Sawed, $12; Posts, per piece, 13c; Dressed Boards, ₱ M ft, $25.

On a credit of 60 days or less, or a discount of two (2) per cent for cash only. On all credits exceeding 60 days' time, not less than one (1) per cent per month to be added.

Under the rules of the Exchange, no "lump" sum will be given on any bill of lumber.

Nails.

We give the price list of the Pacific Iron and Nail Company.

FENCE AND BRAD.—10d to 60d, $2.90: 8d and 9d, $3.0; 6d and 7d, $3.25 4d and 5d, $3.50; 3d, $4.25; 2d, $5.50.

BARRELS.—¾ inch, $6.75; ⅞ inch, $5.75; 1 inch, $5.25; 1¼ inch, $4.50; 1½ inch, $4.25; 1⅝ inch, $3.75; 1¾ inch, $3.50.

LINING.—⅞ inch, $7.25; ¾ inch, $8.75.

TOBACCO.—10d, $3.25 8d, $3.50; 6d to 7d, $3.75.

CINCH.—6d to 30d, $4.50.

SLATING.—5d, $3.75; 4d, $3.75; 3d, $4.50; 2d, $5.75.

FINISHING.—2d, 1 inch, $3.75; 3d, 1¼ inch, $6.75; 4d, 1½ to 1⅝ inch, $4.50; 6d, 2 inch, $4.25; 8d, 2½ inch, $4.00; 10d, 2 inch and over, $3.75.

CASING AND BOX.—10d to 30d, $3.50; 8d, $3.75; 6d, $3.00; 4d, $4.25; 3d, $5.25.

FINE BLUED.—4d, $4.50; 3d, $5.75; 2d, $6.50.

CUT SPIKES.—All sizes, $3.00.

BOAT SPIKES.—All sizes, $3.50.

Each half keg 10 cents extra.

TERMS.—Note or acceptance at 60 days with current rate of Exchange on S. F., or a discount of 2 per cent for cash, if remitted within 10 days from date of invoice.

All accounts when due subject to sight draft without notice.

An abatement of 10 cents per keg will be allowed upon orders of 200 kegs or over.

Building Material.

Lime, per barrel, $1.50@$1.60. Plaster, $2.75–3.00. Eastern Plaster, $3.00–3.25. Rosendale Cement, $2.25–2.75. Portland Cement, $3.50–3.75. Fire Brick, per 1,000, $40 @ $45, according to brand; hard, $10.00@$12,00; red, $8.00@$8.50; soft, $7.50; face, $30.00.

THE IRON-WORKERS' STRIKE.—The strike among the men in the large foundries and machine shops in this city, which has been in progress the last two weeks, came to an end on Thursday. On that day it was decided by the employers to take the men back at the old rate of wages, and on Friday most of them returned to the shops. It is probable, however, in view of the business depression in this branch of trade, that work will be continued for a time with reduced force. It is hoped that when spring opens there will be a revival of work, so that the foundries can again run full-handed on full time.

THE Hocking Valley strikers have been starved into accepting their employer's proposition and are going to work.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING FEBRUARY 10, 1885.

311,949.—STEPLADDER—Chas. Brand, Oakland, Cal.

312,084.—MACHINE FOR SCREW THREADING WIRE—A. Cavalli, S. F.

311,972.—AUTOMATIC LAMP—T. A. Fitzsimons, S. F.

311,980.—PLOWSHARE ATTACHMENT—Samuel Hamilton, Salinas, Cal.

311,990.—COFFEE POT—E. H. Judkins, S. F.

312,225.—STAMPING MARGINS FOR CEMENT PAVEMENTS—C. Sutton, S. F.

312,043.—WALL PAPER TRIMMER—I. C. Van Horn, Livermore, Cal.

11,907.—TRADE MARK FOR COKE—Balfour, Guthrie, & Co., S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

COFFEE-POT.—Edwin H. Judkins, S. F., No. 311,990. Dated Feb. 10, 1885. In this coffee-pot a novel adjustable or removable strainer is placed inside and covering the base or entrance of the spout. The object is to provide suitable and convenient means within the pot itself, whereby the coffee-can be poured directly from the vessel in which it is boiled and still be clear and free from grounds.

PLOWSHARE ATTACHMENT.—Samuel Hamilton, Salinas. No. 311,980. Dated Feb. 10, 1885. This is an attachment for plowshares and a means of securing the same. It consists of a thin strip or ribbon of steel, which extends along the edges of the share, projecting beyond it and the point, so as to receive the wear. This strip is secured between the edge of the share and a supplemental plate, which is bolted or secured above, so as to act as a clamp and hold it in place.

STEP-LADDER.—Charles Brand, Oakland. No. 311,949. Dated Feb. 10, 1885. The improvements consist in the usual brace by which the folding legs are held open when in use, and a swinging platform or basket-holder jointed to the legs of the ladder and adapted to fall to a horizontal position as the legs are spread, and folded up as they are closed. The object is to provide a step-ladder having a strong and serviceable brace and an automatically acting platform, to be used as a holder for a basket in picking fruit, or for a paint can or similar purposes.

STAMPING MARGINS FOR CEMENT PAVEMENTS.—Charles Sutton, S. F., No. 312,225. Dated Feb. 10, 1885. This is a die for stamping margins in order to imitate what is known as chisel work on natural stone; and the invention consists in the peculiar formation of the die. It has been customary heretofore to simply divide the blocks of cement-work by means of a suitable tool, which by being drawn along the yet unhardened cement, cuts into it, and to make no margin or border whatever on it. In some instances, however, a line parallel to the dividing line has been made by a trowel in a similar manner, which is supposed to indicate a border; but with the manner of its formation and the character of the border thus formed it differs from Mr. Sutton's invention in that his is formed by stamping directly, and not by a draw-cut, and he proposes to make a border in imitation of such as are generally made by chisel work on the natural stone.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JAMES C. HOAG—California.
J. J. BARTELL—Sacramento and San Joaquin Counties.
A. C. KNOX—San Benito and Monterey Counties.
GEO. MCDOWELL—Santa Clara County.
G. W. INGALLS—Arizona.
M. S. PRIME—Alameda County.
MRS. OZIER—Humboldt County.
E. G. NORTHUP, Sacramento County.
W. H. H. HUSSEY—Contra Costa County.
E. L. HUNT—Lake County.
C. M. CARR—Oakland.
W. B. TURNER, Los Angeles and San Bernardino Cos.
J. M. LOGAN, San Francisco.
F. W. SMITH, Arizona.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent.

Partner Wanted in a Patent.

I have invented a valuable patent, which has been allowed in the U. S., and want to secure partners to take out patents in foreign countries on reasonable terms. Write to or call on J. PETTINGER, International Hotel, San Francisco, Cal.

About Obtaining Patents.

Patents are Virtually Contracts

Between inventors and the public. The consideration flowing from both parties to the contract is expressly fixed by statute. The Government requires the following consideration in every case: First, that an applicant for a patent shall disclose a new and useful improvement, of which he is the first and original inventor. Second, that the invention has not been patented, or published in a printed publication prior to the date of his invention. Third, that the invention has not been in public use, or on sale, more than two years prior to his application for a patent. Fourth, that the invention shall be properly described and claimed in the specification forming a part of the patent. Provided an inventor complies strictly with these conditions, the Government guarantees that the inventor shall have the exclusive right to make, use and sell the thing invented for the term of seventeen years.

The Patent Law provides that in case a patent, which is the evidence of the contract, is not executed in compliance with the requirements of the law, it may be annulled and rendered void. Hence, it is of the greatest importance to every inventor that his patent or contract be skillfully and accurately drafted, that it may afford him complete protection for his invention during the life of his patent.

Secure a Good Patent.

An inventor should first ascertain whether or not his improvement has been patented to another. This requires an exhaustive search among all the patents in the class to which the invention relates. This question can often be answered gratuitously by us. Immediately on receiving full information of the invention, by reason of our long and extensive practice as patent solicitors and editors and publishers of first-class, scientific and industrial journals, during the past 20 years and over. When the question of priority of invention is not so readily to be determined, it is generally best to make what is termed a "preliminary examination," by searching through the patent office reports among the patents in the class to which the invention relates, and referring to our extensive patent library, containing compilations of special classes of American and foreign inventions, mechanical dictionaries, scientific encyclopedias, files of scientific and mechanical newspapers, and an immense number of patent applications by inventors of the Pacific coast, carefully filed by this office since 1860.

If, by this "preliminary examination," the improvement is found to have been previously invented, our client will receive, for the small sum of $5 for the examination, a verbal or written report showing definitely whereby his invention has been anticipated, thereby saving him further expense and perhaps much time, useless delay, anxiety, etc.

To avoid all unnecessary delay, however, in securing patents at the earliest moment practicable, inventors will do well to forward a model, drawing or sketch, with a plain, full and comprehensive description of their invention (stating distinctly what the particular points of improvement are), with $15 as a first installment of fees. If the improvement appears to us to be novel and patentable, the necessary papers for an application for a patent will be prepared immediately, and forwarded to the inventor for his signature. When the inventor receives the application and finds it duly prepared, he will carefully sign and return the same plainly addressed to us, with postal money order or express receipt for our own fee. The case will then be promptly filed by us in the Patent Office, and vigorously prosecuted to secure the best patent possible. (This course is the most expeditious and satisfactory, as no time is lost in transmitting correspondence relative to the preliminary steps to be taken.) When the patent is allowed the inventor will be duly notified, and on sending the final Government fee of $20 to us, we will order the issue of the patent, and forward the same as soon as it is secured from the Patent Office.

The payments are thus divided and made easy. We make no pretence of doing cheap work, in order to entice customers to be afterward make additional charges to bring the bill up to a fair compensation. We do our work honestly and thoroughly, and we never give a case up as long as there is a chance to obtain a patent. The Agency charge is from $25 to $30, or some times more, if the invention is intricate or complicated, or requires much labor. Drawings cost from $5 upward, according to their number and the time employed, and, if a model is sent, the express charges upon this and the papers must be added. The total cost, in addition to Government fees, rarely exceeds $40, and for this we do all we can without appealing the case.

When the invention consists of a new article of manufacture, a new composition, samples of the separate ingredients sufficient to make the experiment, and also of the manufactured article itself, must be furnished.

Models and Drawings.

Models are now seldom required by the Commissioner of Patents, and generally only in intricate cases. Perfect drawings of practical working machines are considered more satisfactory to the Patent Office than the old and more cumbersome system of storing up an immense bulk of almost numberless models.

Drawings or sketches, sufficient to illustrate clearly the invention, with a sufficient description to enable us to make a full set of perfect drawings for the Patent Office is all that we require. A model will answer our purpose as well however, in cases where the inventor can more easily furnish it for our use.

The value and even the validity of a patent often depends on the character, clearness and sufficiency of its drawings. There are thousands of existing patents in which the improvements are but partially or very poorly illustrated in the drawings. When an attempt is made to dispose of such patents, the vagueness and defects of the drawings often prejudice capitalists and manufacturers against the invention, while in reality it may be of great value, and would meet with ready sale had the invention been fully portrayed by artistic and skillfully executed drawings. Again, when patents of this character are brought into court, the uncertainty and ambiguity of the drawings enable the opposing experts to mystify judges as to the construction or combination of parts intended to be covered by the patentee. In all cases prepared by us, the drawings are made under our personal supervision, by skilled draftsmen in our constant employ, and every precaution is taken that the invention is fully and clearly shown by different views, so that the improvement will be readily understood by the Examiners in the Patent Office, and comprehended by the public when the patent is granted.

In the Patent Office

The application is assigned to the Examiner having charge of the class to which the invention relates. The case must then take its turn with others in the order of filing, and in due time is carefully examined to test the novelty of the invention. If the examiner fails to find anything that anticipates the invention, a patent is immediately allowed, provided the specification and claims are drafted in proper form. Should the Examiner find a prior patent which, in his opinion, anticipates one or more of the claims in the application, a letter of rejection is sent to the attorney in charge of the case; and, if the attorney coincides with the views of the Examiner, the claims rejected are erased. In preparing applications for patents, an attorney should be careful to familiarize himself with the class of inventions to which the application pertains, so that the specification and claims may be drafted as nearly perfect in the first instance as is possible. This course saves much time in prosecuting the application to a patent.

When claims are improperly rejected on patents which do not anticipate the spirit or wording of the claims, proper steps are immediately taken to convince the Examiner of his error. This is done, in most part, by personal arguments, as the differences in construction, operation, function and results are more readily discovered and appreciated by an oral presentation of the facts than can possibly be done by relying solely on written arguments. In order that the Patent Office record of the patents shall be complete, an oral argument is generally supplemented by a manuscript brief, that others, in examining the files at any future time may clearly comprehend the position taken by the Examiner and attorney in prosecuting the case to patent.

In addition to our own personal attention to the interest of our clients here, we have, for over 12 years past, had constantly in association with us in Washington, one of the soundest legal counselors and ablest of practitioners in patent business in this country, who carefully attends in person to our business at the Patent Office, and has attained success in a most marked degree.

Perfect Claims.

The value and force of a patent are dependent on its claims. A patent may disclose to the public the most important and valuable invention, and yet the claim be of such meager scope that the patent is actually worthless. When the claims of a patent are so loosely drafted that infringers can flood the market with improvements, differing from the improvement disclosed by the patent only in slight changes in construction and arrangements of parts, such a patent is valueless to the owner, as it fails to afford him that exclusive and complete protection guaranteed by the Patent Law. Hence it is that the greatest care, skill and perseverance are required, first, in properly drafting the claims in the first instance, and second, in prosecuting the application before the Patent Office, and maintaining the rights of the inventor to claims as broad and sweeping as the invention will warrant. This latter is no easy task. The Examiners of the Patent Office serve in the capacity of attorneys guarding the interests of the public. It is their sworn duty to exercise the greatest care and watchfulness, that patentees do not secure claims of greater scope than they are justly entitled to. It is but natural that Examiners are sometimes in error as to just what scope should be accredited an invention. Although the Examiners act under honest convictions in cases where they refuse an inventor his just rights, yet it is the duty of the attorney to maintain the claims of his client, if he is convinced that they are just and proper. To succeed in this requires the display of tact, firmness and ability; and when the Examiner is made to see that the inventor is honestly and fairly entitled to the claims which have been rejected, he will almost invariably recede from his former action, and allow the case.

Advantages to Inventors on the Pacific Coast.

The firm of DEWEY & Co. (continuously editors and publishers of the MINING AND SCIENTIFIC PRESS, nearly from its early commencement in 1860) offer comparatively far better facilities to the local inventors of the Pacific States and Territories than are possessed by any other agents in America. Members of the firm give personal attention to the applications entrusted to their care. They have been longer in practice in patent soliciting than most agents who are still personally engaged in the business. They have secured more U. S. and foreign patents in the past 20 years (with very few exceptions) than any other firm still existing. Their practice has been so successful and long continued, that the great majority of inventions on this side of the American continent have been patented through their agency, thus affording them great and valuable experience, by thorough information of the true principles and points of novelty in the inventions, whether general in character or peculiarly local to this coast.

The extensive business combination and experience of this firm is undoubtedly one of the most fortunate in existence for affording inventors prompt and reliable advice, and the best possible facilities for securing their full patent rights with safety and dispatch at uniformly reasonable rates.

Every patentee of a worthy invention is guaranteed the gratuitous publication of a clearly-stated and correct description of his invention, in one or more of our influential and reliable newspapers, affording just the circulation that is best calculated to widely inform the class of readers most specially interested in the subject of his invention.

Saving of Time, Etc.

Inventors on this coast will find that owing to our familiarity with inventions and local affairs of this coast, we can more readily and fully comprehend their wants, and thus save much of the time ordinarily consumed in preliminary writing back and forth when distant agencies are employed.

Caveats.

A Caveat is a confidential communication made to the Patent Office, and is therefore filed within its secret archives. The privilege secured under a caveat is, that it entitles the caveator to receive notice, for a period of one year, of any application for a patent subsequently filed, and which is adjudged to be novel, and is likely to interfere with the invention described in the caveat, and the caveator is then required to complete his application for a patent within three months from the date of said notice. Caveat papers should be very carefully prepared. Our fee for the service varies from $10 to $20. The Government fee is $10 additional.

To enable us to prepare caveat papers, we only require a sketch and description of the invention.

Rejected Applications.

Inventors who have rejected cases (prepared either by themselves, or for them by other agents), who desire to ascertain their prospects of success by further efforts, are invited to avail themselves of our unrivaled facilities for securing favorable results. We have been successful in securing Letters Patent in many previously abandoned cases. Our terms are always reasonable.

Inventors who do business with us will be notified of the state of their application in the Patent Office, when it is possible for us to do so.

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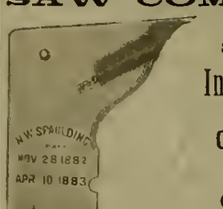

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NOTICE is hereby given that at a meeting of the Trustees, held on the twenty ninth day of December, 1884, an assessment (No. 1) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, No. 402 Front street, room 8, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the fourth day of February, 1885, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday the twenty-seventh day of February, 1885, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

MARK T. ASHBY, Sec'y.

OFFICE—No. 402 Front St., Room 8, San Francisco, Cal.

By order of Board of Directors, delinquency under above assessment is postponed to Wednesday, February 25, 1885, and the day of sale is postponed to Friday, March 20, 1885.

MARK T. ASHBY, Secretary.

DIVIDEND NOTICE.

Plymouth Consolidated Gold Mining Company, No. 23 Nassau street, New York Feb. 2, 1885.

DIVIDEND No. 21.—The Board of Trustees of this Company have this day declared the regular monthly dividend of fifty thousand dollars, being one per cent on the capital stock, or fifty cents per share, payable on February 5, 1885. W. VAN NORDEN, President.

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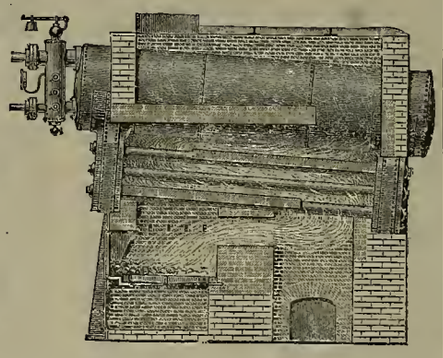

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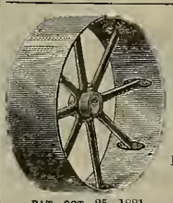

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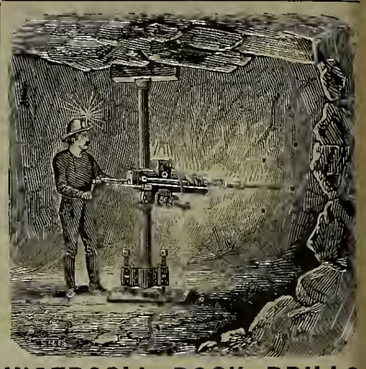

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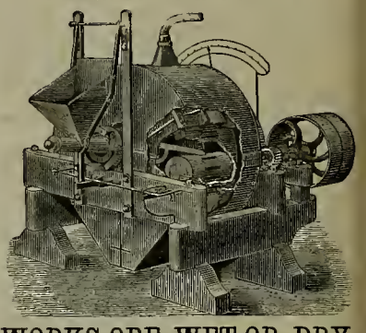

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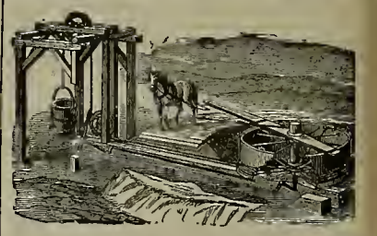

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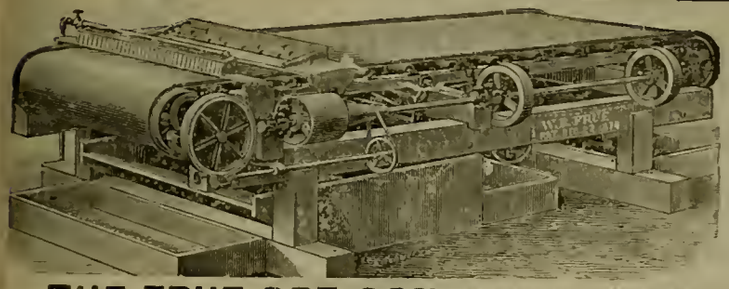

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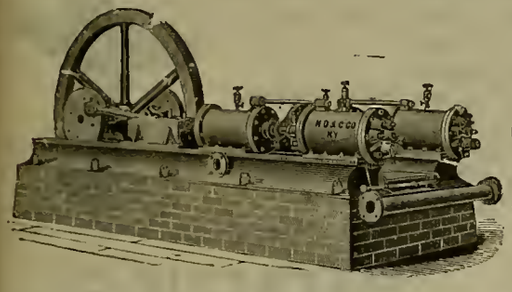

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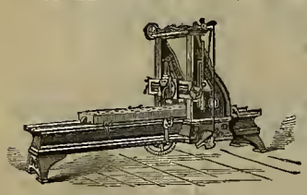

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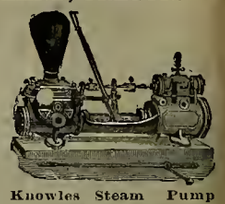

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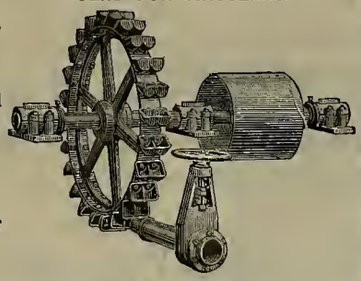

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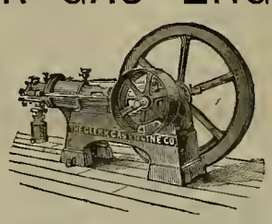

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, FEBRUARY 28, 1885.

VOLUME XLXX Number 9.

The New Clayton Air Compressors.

The engraving herewith represents, in isometrical perspective, the latest improved pattern of the Clayton Duplex Air Compressors, at work at the Big Bend Tunnel and Mining Company, Oroville, Butte county, in this State. These compressors enjoy an enviable reputation for economy and efficiency, amongst the mining, tunneling, railway and engineering interests, not only in the East, where they are manufactured, but also on the Pacific Slope, where numbers of them are in operation. Shipments of these compressors have also been made to Australia, Russia, Mexico, Canada and to several of the South American republics, a "special export compressor" being made which is divisible into sections, weighing less than 300 pounds each, for easy transportation on pack mules or otherwise.

Recently these compressors have been further improved. Being of duplex pattern, with cranks set on the quarter, they admit of the location of the fly-wheel in the center of the machine, which adds to its compactness, equalizes the strain—on account of the action being direct—and by this plan a very important defect in compressors of other construction is avoided, *i. e.*, the main journals are thereby removed from the heat of the steam cylinders, which effects a great saving in wear and trouble, and an extravagant use and waste of oil in ineffectual efforts to keep them from cutting.

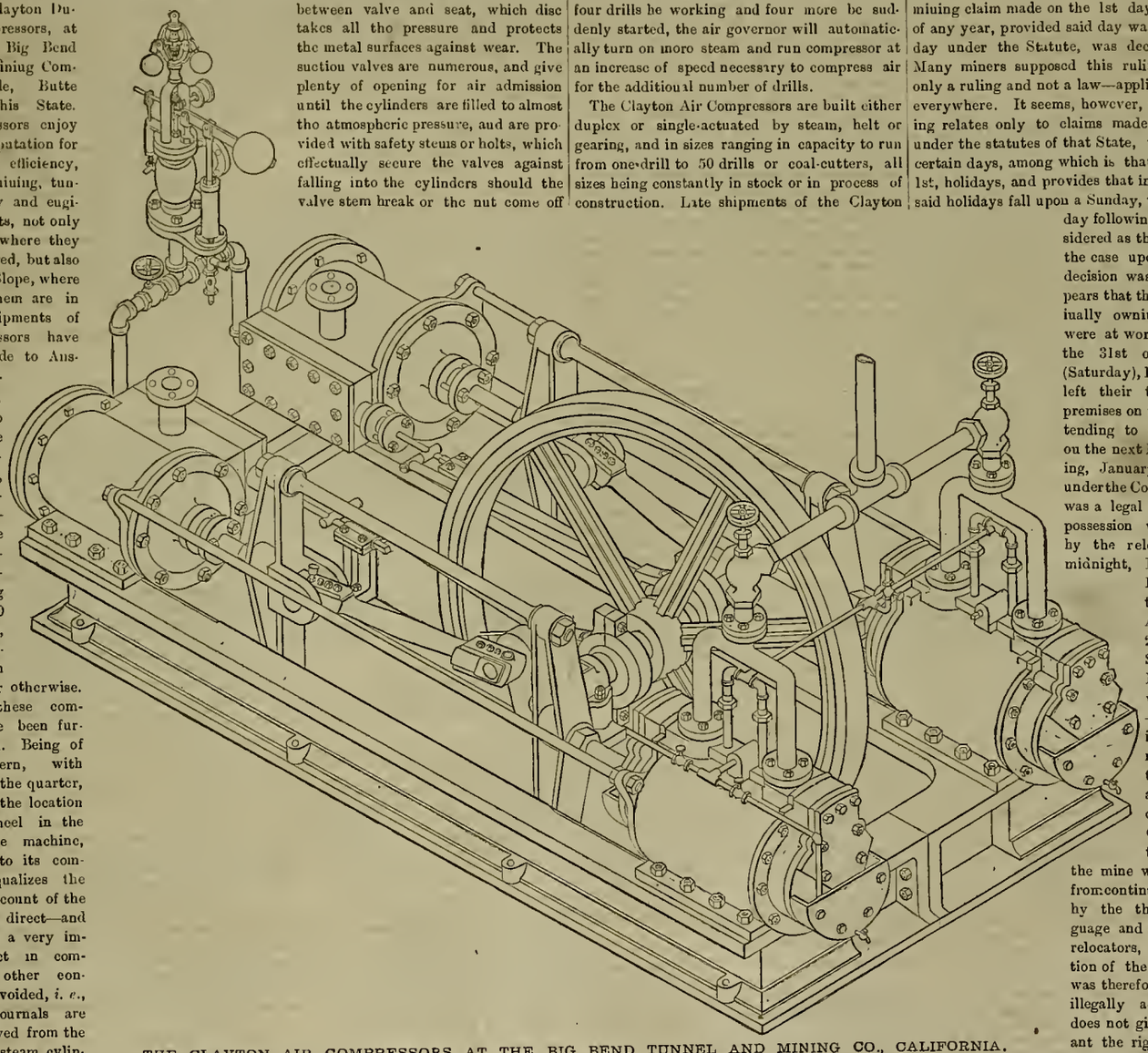
These compressors have the advantage of a long stroke; connecting rods of improved pattern are used. A heavy rod connects the cross-heads on top and a distance piece on the bottom serves as a slide, working on a long, adjustable guide, and by its use the cylinders are relieved from the weight of the pistons, rods, etc. In these machines there are no sliding valves, rotary valves, or so-called positive moving valves, for the admission of the air, as such valves produce much friction and wear and can be kept tight a short time only. All sliding valves are difficult and expensive to repair.

The induction and eduction valves are of the poppet style, are placed in the cylinder heads, and are so arranged that the valves and seatings can be inserted or removed from the outside. These valves have a slightly elastic disc, between valve and seat, which disc takes all the pressure and protects the metal surfaces against wear. The suction valves are numerous, and give plenty of opening for air admission until the cylinders are filled to almost the atmospheric pressure, and are provided with safety stems or bolts, which effectually secure the valves against falling into the cylinders should the valve stem break or the nut come off and the valve can be fastened against the seat until it is convenient to repair it. The air cylinders are encircled by water-jackets of patent design, which are so constructed as to force the water to circulate along the top to and around the ends of the cylinders, discharging from the top and thus equalizing the temperature of the cylinders to a uniform degree their entire length.

The builders of these compressors have the sole license to use the patent "Air Governor" for regulating the speed of compression and the pressure of air on the pumps, rock drills, hoisters or other machinery; thus, if 80 lbs. pressure of air is required to operate the drills, weight the lever on air governor to that pressure, and should eight drills be working and four of them suddenly shut down, the governor will close off the steam sufficiently to reduce the speed of the compressor to the amount of air required for the remaining drills. And, *vice versa*, should four drills be working and four more be suddenly started, the air governor will automatically turn on more steam and run compressor at an increase of speed necessary to compress air for the additional number of drills.

The Clayton Air Compressors are built either duplex or single-actuated by steam, belt or gearing, and in sizes ranging in capacity to run from one drill to 50 drills or coal-cutters, all sizes being constantly in stock or in process of construction. Late shipments of the Clayton Air Compressors embrace large size compressors to the Fresno Enterprise Company and Gertrude Company, California; the Copper Queen Mining Company and the Tombstone Mining and Milling Company, of Arizona; the Northern Pacific Extension (for tunneling work) and consignments to Mexico and the West Indies.

These works have issued a new illustrated catalogue, giving prices and description of the Clayton Air Compressors, rock drills, hoilers, pumps and complete plants and copies of same. Estimates and information will be cheerfully furnished on application to the Clayton Steam Pump Works, 41 to 49 York St., Brooklyn, N. Y.



THE CLAYTON AIR COMPRESSORS AT THE BIG BEND TUNNEL AND MINING CO., CALIFORNIA.

MINERS' wages for underground work throughout all the camps of Montana are $3.50 per day.

Mining Locations on Holidays.

A short time since the Secretary of the Interior made a decision in which a relocation of a mining claim made on the 1st day of January of any year, provided said day was a legal holiday under the Statute, was declared illegal. Many miners supposed this ruling—for it is only a ruling and not a law—applied to claims everywhere. It seems, however, that the ruling relates only to claims made in Colorado under the statutes of that State, which makes certain days, among which is that of January 1st, holidays, and provides that in case any of said holidays fall upon a Sunday, then the Monday following shall be considered as the holiday. In the case upon which the decision was given it appears that the parties originally owning the mine were at work upon it on the 31st of December (Saturday), 1881; that they left their tools on the premises on that night, intending to resume work on the next Monday morning, January 2d, which, under the Colorado statute, was a legal holiday; that possession was obtained by the relocators after midnight, December 31, 1881, and prior to 7:30 o'clock A. M., January 2, 1882, on Sunday, or on Monday, which was a holiday—by stealth, in the temporary absence of the applicants, and in violation of the laws of Colorado; and the owners of the mine were prevented from continuing their work by the threatening language and conduct of the relocators, also in violation of the statutes. "It was therefore a possession illegally acquired, and does not give the protestant the right to relocate the premises." Thus it will be perceived that the ruling only applies to locations in Colorado under the statutes of that State, and to the peculiar circumstances of a particular claim, and is not general in its nature. It probably means, in effect, that while doing assessment work the original owners can leave the claim on Sunday or a legal holiday without having it jumped.

A NEW mining district near Winnemucca has been organized on the east side of the Jackson Creek mountains by a party of prospectors and named Jackson District. It promises well.

THE leading silver mines are cutting down expenses in every possible way so as to overcome the heavy discount in silver.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Willow Creek Mines.

EDITORS PRESS:—Having a good many inquiries from private sources about this region I thought a few lines in your valuable paper might he of general interest to the mining public. Willow creek is on the Silver City stage road, 55 miles north of Winnemucca; the mining district is called "Rebel creek," and embraces quite a large tract of country between here and Paradise, the latter place heing about 12 miles due east from us over the mountains. The country rock is slate, with an occasional dyke of porphyry which crops out here and there among the foothills, but is seldom encountered in the mines. We have a great many ledges of quartz, running north aud south with the country rock, and all showing free gold in greater or less quantities. None of the claims have been worked enough to ascertain the extent or richness of the leads, but the samples of free gold-bearing quartz hrought iu daily hy prospectors are of such a character as to warrant a much more thorough development than has hitherto been attempted. Some of the quartz pounded up and horned out hy the miners give immense prospects, and assays of several thousand dollars to the ton are not at all uncommon, while some of the ledges are twenty to thirty feet in width. It is very hard, as yet, to speak with any certainty as to the future of these veins, owing to the very small amount of work done upon them; but if they hold out in depth as well as they show upon the surface, Willow Creek will become a power in the State, and what is now a mere stage station with a few miners' cahins scattered along up the canyon, will become a very lovely and prosperous town.

The mines now attracting most attention here are the "Wild Deer," owned by H. H. McColley, and the "Ohio," owned by the Brooklyn Mining Co., of Salt Lake, and bought hy them quite recently from the original locators. Both of these mines have true, well-defined veins, and are very likely to come to the front this season as good bullion producers. The product is mostly silver, though late assays from the main incline on the Wild Deer, at a depth of 130 feet, run as high as $80 in gold, same assays in silver ranging from $100 to $400. About a dozen men are employed in each of the above mines, and every foot sunk shows an improvement in the size and richness of the ledges. About fifty men are at work altogether in the district, and many more are expected in the spring. We have plenty of water, a fine stream running down every canyon. All we waut now is good society to make everything lovely. J. M.

Walnut Creek, Humboldt Co., Nev., Feb. 18, 1885.

Lava Creek Mining District, Idaho.

EDITORS PRESS:—The Lava Creek district, which is attracting considerable attention among Idaho mining men, is situated 70 miles south from Hailey, about two miles east of the old Champagne Station on the old Blackfoot stage road. The reports from this district are very favorable, and the few mines, which are opened, are so exceedingly rich that it sounds more like a tale from the "Arabian Nights" than reality. But we can state some facts, gathered from actual observation, which indeed fall not very far short of reports of that kind. The first mine discovered last summer was the "Horn Silver," owned hy Frank Martin. They are down on the ledge some 20 feet, where the ledge proves to be seven feet between walls, all in porphyry formation. The ore is horn and native silver, averaging $800 to $1,200, free milling. Frank Martin shipped about two weeks ago four tons of his ore to Salt Lake, which netted him $6,000. He has, we are informed, ordered a 10-stamp mill, to be in operation early in the spring, All mines on tbis ledge, towards the south are proving equally good, and the excitement is running high already, on account of the exceeding richness of the ore. There are five spleudid prospects taken up along the large croppings, which, happily, are owned hy responsible parties, who will, as we learn, go to work in earnest early in the spring, to work their mines systematically. The hest property, so far as can he judged at present, outside of the Horn Silver, is the Silver Medal, Silver Cup, and Darling, all owned by Wm. Bayhause, Prof. Delius, Joe. Feshie and others, these three mines, lying on the extreme south end of the Martin ridge. Some ore from the Darling exceeded the most sanguine expectations in assaying as high as $8,000 to the ton. Pretty near as high run assays from another mine, the Ajax, owned by Boise, Parlocs and others, this mine lying about two miles southeast from the Horn Silver mine. The country seems to be a network of rich veins, and looks like a graveyard, as an old miner said, by looking at the forest of stakes and monuments put up last fall. I will give you in tbe near future some more particular news of this new mining district, which is thought by many who have visited it to rival any other mining field on the coast. Every body is happy who was fortunato enough to secure a claim. L. P.

The Desilverization of Lead by Electrolysis.

A short time since N. S. Keith, of New York City, read before the American Institute of Mining Engineers, a paper on the above subject, as follows:

It seems proper, before describing the plant which has been erected in Rome, N. Y., for the purpose of demonstrating the practicahility of my process of refining and desilverizing lead hy electrolysis, to state in a few words the principles that govern the process. They are well-known to those who have studied electrical science, and to the practical electro-platers of the country, and are briefly these:

If we take a plate, or other form, of metal (impure lead in this case), and immerse it in a bath consisting of a solution of the main metal (that which contains the impurities), and also immerse another plate, which shall he a conductor of electricity, in the bath, but separated from the first by the solution, and connect the former plate with the positive pole of the source of electricity, and the other plate with the uegative pole, an action will go on in this bath which is called electrolysis. There is first a decomposition of the solution constituting the bath; then a solution of the metal at the positive pole (called the *anode*), and a deposition upon the other plate connected with the negative pole, which plate is technically called the *cathode*. If the hath is properly constituted, and the current of electricity which is passed through the bath is of the proper strength and electro-motive force, the dissolution of the anode and the deposition of the metal upon the cathode will he exactly equivalent. The analysis and synthesis are opposite and equal. If, on the other hand, this solution (called an *electrolyte*) be not properly constituted, decomposition will go on, hut there will be these effects: a superoxidation at the auode and a liheration of free hydrogen at the cathode, which free hydrogen escapes finally in bubbles through the liquid to the surface, and into the atmosphere. In the electrolytic treatment of metals simply for their purification and recovery, it is important that the electrolysis should be so constituted that nothing will be dissolved from the auode but that which is to be deposited upon the cathode; and the actiou should take place in exactly equivalent quantities. In this case, for a given weight of lead dissolved from the anode, a given weight of lead should be deposited upon the cathode. If not so, there will he a waste of electrical energy in the liberation of the hydrogen which escapes to the atmosphere. There is a decomposition of the electrolyte; oxygen is freed at the anode, and suh-oxides and suh-salts are then formed, which finally act to cut down the current of electricity, or, in other words, act contrary to the electrical energy. This action is, therefore, not only economical, in the way of the production of the metal, but uneconomical also, hy reason of the decomposition of the electrolyte, which should remain permanent in its constitution to avoid expense to say the least. With these principles in view, I commenced, several years ago,

A Seriee of Experiments,

As is probably familiar to the most of our members, through articles published from time to time in various journals, and papers in the *Transactions* of the Institute. These experiments were undertaken for the purpose of demonstrating the practicability of treating a material which is produced in ahundance in this country—work-lead, or "hase-hullion."

In the pursuit of this investigation I tested my solutions as electrolytes, and finally settled upon a solution of acetate of soda, in which is dissolved sulphate of lead. The chemical reasons I need not enter into here. Suffice it to say, in the use of this bath, the dissolution of the lead from the anode and its deposition upon the cathode are exactly equivalent. This condition was secured after trying many solutions, which, after a time, were found to suffer decomposition. The acetate solution above mentioned has shown itself, in many months, amounting to years, of trial, to maintain perfectly its integrity of constitution.

A few months ago, the erection of

An Experimental Plant Was Commenced

at Rome, N. Y., on a considerahly larger scale than anything I had undertaken before, for the demonstratiou to capitalists of the feasihility of this process. When I commenced the experiment years ago, electrical science and appliances for the economical production of electricity had uot reached thc preseut advanced stage. Now we seem to have approached very nearly to perfection, since we are ahle to convert mechanical energy into that form which we call electrical energy with very slight loss. Dynamo-electric machines are used which return in electrical energy 84 to 96 per cent of the actual mechanical euergy applied to them hy the belt of the steam engine. I will now describe

The Steps of the Process

To which the base hullion is submitted at this establishment in Rome, giving merely a short account of the main apparatus, and leaving to some future paper the electrical and chemical considerations involved in the process.

The metal is brought in pigs to the works, and is taken to a reverberatory furnace having a howl-shaped hearth. At the bottom of the hearth is an iron pipe leading through the outer wall of the furnace. At the end of this iron pipe, within the bowl, there is a valve which opens inward hy means of a rod passing through the pipe. The metal melted in this hearth is submitted to the action of a reducing flame produced with wood. About one-third of a cord of hard wood is burned in ten hours, and ten tons of bullion is melted in that time. Alongside the furnace is a frame which carries twelve moulds. These moulds are made to cast plates of bullion of the size 24x6x¼ inches. The frame is annular, and revolves upon rollers along the side of the furnace so as to bring the moulds (which are placed vertically on the ring) successively under the pipe from the furnace. As each mould is brought to the place, an attendant moves the valve to draw enough of the metal to fill it, and so on in succession.

As the frame is rotated, other workmen open the moulds, by turning down one side of each, and remove the plates; but before olosing the moulds they put in each some pieces of perforated copper ribbon, which, being subsequently surrounded by the metal of the next cast, serve for the suspension of the plate. The moulds are then closed, and pass on to be again filled in due succession.

After some practice the workmen cast five of these plates per minute. The average weight is 7.6 pounds, so that we get 38 pounds of metal cast per minute, or a little over a ton per hour.

The plates are then taken by other workmen and hung temporarily by the copper strips on hooks, while a muslin bag is drawn over each plate from the hottom upward. In the following operation, as the lead is dissolved from the plate, there remains a residue, consisting of the impurities of the lead, viz., antimony, arsenic, copper, iron, silver, gold and other metals. This residue would naturally drop to the bottom of the vat and become mixed with the lead. The office of the bag is simply to retain the residue.

After the hag has been drawn upon the plate it is hung upon what is called

The Anode-Frame.

This frame consists of six radial wooden arms fastened to a central cast-iron plate. Upon the outer ends of these arms there are rollers. The whole frame is a little over six feet in diameter. On the under side of these wooden arms are copper conductors placed radially, so that their inner ends are in close contiguity. To these conductors on the under side of the anode-frame are fastened twelve concentric rings, two inches apart, and upon these rings are metal hooks for the purpose of receiving the plates of bullion hung hy the copper strips. The anode-frame holds two hundred and seventy-six of the plates, which hang on the twelve concentric rings from the frame above. The anode-frame is lifted from its place of rest by a traveling crane, carried and lowered into a vat containing the eloctrolyte which I have described. These vats, of whicb there are thirty in this plant, holding each a little over a ton of the metal, are six feet, one inch iu internal diameter, and are constructed of an asphaltic cement upon an asphaltic floor, so as to make them water-tight.

There is a System of Pipes

Or conduits for the electrolyte, so that it may be conducted to each vat as desired. Thence it continually overflows the edge of the vat into gutters between the vats, and returns to an underground cistern, whence it is pumped to an overhead cistern which supplies a head to force the solution to enter the vats. In that way we obtain a continual circulation of the solution, which is necessary both electrically and chemically.

Within each vat there is also placed what is called a cathode-frame. This is built up of 13 sheet-brass cylinders, placed concentrically, two inches apart. When the anodes are lowered into the vat they pass between the separate cathode plates, so that a cathode is upon either side of each anode-plate, at the distance of about one inch. The vats are so connected with the source of electricity, that the current passes from a dynamo into vat No. 1 and up through the center of a core, two feet in diameter, built within the vat. This is built witbin the vat for two purposes: first, to sustain the copper conductor, which passes up in its center; and second, for the purpose of occupying (instead of the solution) the central part of the vat, since it would not he practicable to hring the plates in annular arrangement around the center any closer than two feet.

Each one of these vats holds 600 gallons of the electrolyte. The conductors leading to the vats are 1½ inches diameter round copper. From the inner periphery of each vat a copper conductor passes through the side and down underneath to the center of the succeeding vat, and so on over the whole series of thirty. The dynamo used is one made hy Mr. Edison for the purpose. It furnishes an electric current having a difference of potential, or an electro-motive force at its binding-posts, capable of rising to six or seven volts; but in practice we use the current up to two and a half or three volts. The current which it supplies can be varied to suit the requirements of the case, hut has been made as great as 1400 amperes, and from that to a thousand, and helow; but the production of lead is in exact proportion to the amperes of current. One thousand amperes of curreut passed through these vats enahle us to dissolve thie lead and deposit upon the cathodes at the rate of 8.5 pounds per hour in each vat; so that we succeed in treating one ton of base bullion in each vat in 10 days of 24 hours. The bullion requires no attention after being immersed in the vat, except that it is occasionally turned. This turning is to prevent "short-circuits," and can be done by means of the anode-frame having rollers upon the outer end of the arms, as described, which rollers rest upon the edges of the vat.

The Lead is Deposited

Upon the cathode in feather-like crystals, whch build out from the cathode towards the anode, and in a short time, if not disturbed, would build across, so that the current of electricity, in preference to taking a path through the electrolyte, would pass directly hy the metal, and we would cease to gain any dissolution or deposition. Hence the opsration of turning, which is now done hy means of a lever; but it is in contemplation to have the movement take place continuously hy mechanical power. After the lead is nearly all dissolved (some 5 per cent is left) the anode-frame is lifted out, the hags are removed, and the residues are washed out into a vat.

After these residues settle to the hottom the water is drawn off by means of a syphon, and they are mixed with nitrate of soda in proper proportions and fused. As a result the gold and silver are found at the bottom of the crucible, and the other metals are retained in the slag. The economical separation of these metals, such as antimony and arsenic, will be pursued. The residues, when dried, appear as a black, impalpable powder, but at the same time of sufficient coarseness not to pass through the muslin bag. They can be readily filtered from the solution through coarse twilled muslin.

This plaut, as laid dowu, has demonstrated the feasibility of the plan. It has been found somewhat imperfect, and has demonstrated all the questions which have arisen relating to economic treatment. Other vats will be built to avoid the mechanical difficulties which we have encountered. The main difficulty is one of leakage. Unfortunately thc vats were placed upon imperfect foundations, and from the weight of the solution, the metal, etc., they have settled somewhat unequally, and cracked, so that we unavoidahly lose considerable solution through the ground hclow. It is contemplated hereafter to place the vats upon a superstructure of timber that will enahle us to get at the bottom and remedy any leakage if such arise. Perhaps no leakage would have occurred in this case if the foundation had heen properly construct d.

We will give the discussion on the above paper next week.

One Benefit of Dull Times.

There is to day a feature in mining, in Nevada, says the Eureka *Sentinel*, which is hound to hring in capitalists ultimately, the inducements for their coming being too great for them to withstand much longer. What we refer to is the large number of mines which are heing worked hy the owners themselves. Many of the owners are becoming independent. In Eureka District alone there are at least 50 properties, which, a year ago, notwithstanding the better state of business then, could have been bought for one-half the amount which would be required to purchase them to-day. For instance, a man doing business on a small and losing scale in town, was obliged to go to work on a claim he owned. He was apparently irretrievably in debt, and was paying two per cent per month on money borrowed. Through good luck, pluck and hard work, he is to-day out of debt, and has sufficient money ahead to buy a good home in town for his family. Before he went to work on his mine, it could have been bought for possibly a few hundred dollars; to-day, it would take as many thousands. This is hut one of the great many cases that could he mentioned. Nor is this state of affairs confined to Eureka District or Eastern Nevada. The same can he said of the State generally. Another instance worthy of mention is that of Mr. Mills Van Wagenen, for many years a teacher in schools in Storey and Lyon counties. Having failed last fall to get a reappointment, he went to work on a claim he owned near Silver City, and he is now taking out some very rich gold-bearing rock, and is in a fair way of making a handsome fortune should the ledge hold out in depth and prove as rich as it is near the surface.

Mining in Nevada has been manipulated almost altogether in behalf of stock jobbers, but the legitimacy of the business is to-day showing itself. Witb a due allowance of caution and knowledge mining is as safe and as profitable an investment as capitalists can find, and with the turn matters are taking, it will not he long until they will fully realize the fact. "It's an ill wind that blows no one good."

A NEW LEACHING PROCESS.—Halstead Goodrich, bctter known as "Gov." Goodrich, comes to us from Pioche with a new leaching process, and claims that next to nothing will he left in the ore that is treated as he directs, says tbc White Pine *Reflex* of last Saturday. He has tried it in Pioche for a number of years on a small scale, and he thinks he knows whereof he speaks. He claims to have discoverod one of Nature's secrets hy which he can extract all or nearly all that is in the ore at a cost of less than half as at present treated. He has tried the ore around Taylor, and is freo to admit that it roadily yields to the leaching process.

MECHANICAL PROGRESS.

A Rational View of Boiler Explosions.

When the cork of a soda-water bottle is set free it escapes with considerable violence and noise. It behaves in a manner like a projectile shot from a gun. There is this difference, however, between the projectile and the cork, that the whole of the projecting work must be done in the latter after it has left the neck of the bottle. In the case of the gun, the work is done on the shot while it is moving up the barrel and acquiring velocity. The motion of the cork is extremely slow until it escapes from the bottle. The motion of the projectile from the gun is most rapid at the time it leaves the muzzle. We have a strict analogy between the flight of a soda-water bottle cork and that of a shot of boiler plate. The cast-iron top of the dome of a locomotive was, a few years ago, blown through the roof of a station. All the bolts securing the dome-top gave way, and it sailed through the air some hundreds of feet.

Now, it is very easy to say that the flight of this mass of cast-iron is readily explained. "It was blown into the air;" "It was violently forced off by the steam;" "The steam shot it off," and a dozen similar explanations may be given. But engineers do not rest content with vague statements of this kind. They see that the cast-iron must have been put into very rapid motion indeed in a very minute fraction of time, and they want to know how the motion was actively impressed on it. As soon as we begin to use figures we discover that vague generalities really convey no adequate idea at all of what takes place.

Let us suppose, for the sake of illustration, that the cast-iron dome was 18 inches in diameter, 24 inches area, and that it weighed 100 pounds. Also, we shall assume that it was projected to a hight of 100 feet. In order that it should attain to this altitude, it must have an initial velocity at least as great as that which it would acquire if it fell 100 feet. Allowing a little for the retarding influence of the air, the initial velocity must have been 82 feet per second. The boiler pressure being 120 pounds on the square inch, the total effort lifting the dome would be 30,480 pounds. We have, therefore, a force of 30,480 pounds, a velocity of 82 feet and a weight of 100 pounds. Through what space must this force operate on the weight? A very simple calculation suffices to show that the force of 30,480 pounds must act through a space of about .32 of a foot. It will be seen from this that the steam must have exerted its full pressure of 120 pounds on the square inch until the lid of the dome had been parted from it by a distance of about four inches.

In boiler explosions the same thing happens. The pressure follows, so to speak, the flying fragments for a certain distance after disruption takes places. In the same way, the column of escaping carbonic acid gas rising from the neck of a soda-water bottle imparts a high velocity to the cork after this last is quite free from the bottle. It is in this way that the projection of fragments to a great distance is brought about, and we do not think it necessary that water should be called into play for the mere projection of portions of the plates. As we should state the case, the phenomenon of a boiler explosion would be somewhat as follows: First, rending takes place through a weak joint or corroded plate; secondly, there is a violent outburst of steam; thirdly, there is a fall in pressure; fourthly, portions of the water are propelled with great violence against the boiler shell, which is shattered thereby; fifthly, the steam generated from the liberated water imparts, in the way we have tried to explain, high initial velocities to the fragments, converts them into so many projectiles, and spreads ruin around.

The point worth special notice about all this is that the steam keeps together, so to speak, and does not escape by fissures or cracks. It might be thought the moment the steam dome cover, which we have already used for the purpose of illustration, was raised at all, the steam would all rush out sideways, and that the cover would be projected but a few feet. This is not the case; the steam does not diverge to the right or left; its molecules advance, each in a straight line, behaving like a minute projectile; and this columnar advance of gas, free to diverge right or left, but going straight on, is the main cause of the violence of boiler explosions as manifested by the flight of fragments to great distances.—*London Engineer.*

THE LARGEST CONSUMERS OF IRON.—In his recently published work on the manufacture of iron, Mr. Swank says: "The people of the United States are the largest per capita consumers of iron and steel in the world, and of all the nations they are the largest aggregate consumers of these products. Our annual consumption of iron and steel has for several years averaged over 220 pounds for every man, woman and child in the United States, and has aggregated an average of nearly 6,000,000 tons. Great Britain makes more iron and steel than we do, but she exports about one half of all the iron that she makes, and much more than one-half of all the steel. We estimate Great Britain's annual home consumption of iron and steel in late years as less than 200 pounds per capita. Her aggregate annual consumption of iron and steel has averaged about 4,000,000 tons in late years, but of this quantity a large part is eventually exported to other countries in the form of iron ships, machinery, entlery, etc. No other European country equals Great Britain either in the per capita or aggregate consumption of iron and steel, although Germany now follows her very closely in both respects.

Treatment of Steel.

Methods of using steel are as many and diverse as are its users; at least, there are few steel-using mechanics who agree in all the methods of forging, shaping, hardening and tempering a tool. The writer was told recently by an old, experienced mechanic, that no turning or planing tool for iron should be drawn to temper; they should be left as hard as fire and water could make them. This was news to one who forty years ago used Sanderson's and Jessop's steels, and always drew the lathe and planer tools down to at least a straw. But, on seeing the process of the older mechanic, it was noticed that he permitted the steel to become only a dull red in the lead bath before cooling it. It is probable, also, that the steel was not so high as Sanderson's or Jessop's. It was an American steel that has come into favor within a few years.

A certain forger makes a practice of dressing a tool, after he has forged it to form, by light hammering as long as the hammer can make an impression on the metal. The hammering is continued after the color of heat has left the steel. He insists that this dressing "fines" the steel, that is, that it packs its particles and makes the grain closer. But when he tempers the tool he is careful not to heat above a dull red, and then draws to a straw color.

A manufacturer who uses mills (milling machine cutters) in his work continually will not have a mill that has not been well forged from a bar. He prefers the drop forged blanks, which are usually made from a cut-off "chunk" from a bar of square steel. He insists that the tool must be forged to form and not cut from the merchantable bar, however well adapted as to size the bar may be.

Yet another takes a bar of three-inch steel, or perhaps three and a half inches diameter, and cuts off a disk of the proper thickness for the mill he wants, chucks and drills it, mounts it on an arbor, finishes it to size, cuts the teeth and hardens and tempers it. There is not a particle of forging in the work. The same man makes taps and reamers from the bar, choosing a bar to size, and refuses to subject the steel to the hammer. He claims that even the bar commercial steel is overworked in getting it into shape.—*Scientific American.*

MAGNESIA BRICKS.—The use of magnesia bricks instead of dolomite in the process of Bessemer steel manufacture is rapidly extending. M. Ponsard, a well-known engineer, writes to direct public attention to the Schlossing process for obtaining magnesia from sea water for this purpose. Sea water contains magnesia, combined as a sulphate and a chloride, in the proportion of two kilograms of the pure substance to a cubic meter. The addition of a milk of lime throws the magnesia down as a hydrate, the chloride of calcium and a small quantity of sulphate of calcium remaining in the solution. The quantity of lime required is 1.5 to 1 of magnesia. The precipitate is afterwards recovered by filtration through fine sand.

IMPROVING CEMENTS.—W. Mills, of Bedford, finds the hydraulic or setting qualities of limes and cements are improved by mixing soluble sulphates, carbon and certain other salts with the calcined material. The patentee prefers to heat silica, iron and aluminum sulphates, iron oxide, carbon and chalk to redness in closed vessels, and then add the product, when cold, to fresh calcined lime-stone, grinding the whole intimately with some of the following salts, viz., potassium carbonate, ammonium sulphate, sodium carbonate, potassium sulphate and iron sulphate.

GRAPHITE BRICKS.—A French engineer has introduced a new refractory brick made of pure graphite, by perfectly agglomerating the powder of that substance. It is well known that graphite is nearly infusible at the highest temperature that can be produced, and this new class of bricks will doubtless prove very serviceable in metallurgy, where the want of linings which are wholly infusible has long been felt.

BABBITT METAL.—Eight parts of black tin, two of antimony and one of copper, if melted and mixed over a hot fire, form Babbitt metal. If made with care, it is one of the best materials for fast-running machinery there is.

STEEL RIVETS, ETC.—A Pittsburg iron manufacturer predicts that not only will steel nails supersede iron nails, but that we shall soon have also steel rivets, bolts, nuts and all kinds of angles and structural shapes.

THE *American Mechanical Engineer* says: "Receipts for restoring burnt steel abound; the best one we ever found was to throw the burnt steel in the scrap heap, get a new piece, and use more care in working it."

FEMALE BLACKSMITHS.—There are 347 female blacksmiths in England, all of whom actually swing heavy hammers and do men's work.

SCIENTIFIC PROGRESS.

A Sunken Continent in the Pacific.

The fact is quite generally conceded among scientists, that the probabilities are strongly in favor of the supposition that there formerly existed a large island, of continental dimensions, between the West Indies and the western coast of Africa. This continent is supposed to be the "Atlantis" of the ancients, whose recent discoveries point to the further probability that there also once existed a similar continental area of land in the Pacific ocean, between the west coast of South America and the present Australian continent, as it is sometimes called.

At a recent meeting of the Academy of Sciences of this city, Capt. Churchill read a very interesting paper in relation to this matter. His paper referred especially to the gigantic sculptured figures still to be seen upon Easter island, and evidently the work of a different race than that which now inhabits the island, and one much more numerous, since the works referred to are on too large a scale to have been constructed except by many hands. He argued that a vast continent once existed where there is now nothing but a waste of ocean, dotted with countless isles and islets of varying size and character, the majority showing in their formation the traces of that former volcanic action, which either upheaved them from the depths of the sea or shattered and sunk the continent of which they are now the only vestige. Easter island, it is believed, was once the home of a population numbering many thousands, of whom scarcely any now remain. Besides dwelling upon the sculptured figures to be found there, Captain Churchill laid much stress upon the hieroglyphic tablets of wood discovered upon Easter island, and which are the only instance of a written language in Oceanica. He thought sufficient attention had not been given them.

From other sources we learn that a German Government vessel recently visited that island and made a large collection of pre-historic remains, and made copious notes of other matters of scientific interest. The German Government, it is understood, are making preparations to send another expedition to Easter island with a corps of scientists and engineers to sketch the island, surveying the ground, and to make plans and sections of the prehistoric buildings and ruins.

Our own Government has also taken steps to secure some of these valuable remains representing the prehistoric and known races of this hemisphere. Instructions have already been sent to Admiral Upshur, in command of the South Pacific squadron, to send one of his vessels on a cruise in the direction of Easter island and to make such explorations, collections and reports as he may think important in the interests of his Government. The Government of France is also turning its attention to this island with a view to the establishment of a protectorate.

It is reported in the accounts given by the German vessel that the island, which is small, is strewn with large stone images and sculptured tablets. The inhabitants of the island know nothing about the remains, and even tradition gives no account of a people living there when their ancestors arrived.

Field of the Telephone.

Professor Bell is sanguine that the usefulness of the telephone has by no means as yet attained its natural limit. Since the recent decision sustaining the patents of the American Bell Company he has been devoting himself with assiduity to experiments intended to improve the telphone, with the idea of making it feasible to speak over longer distances than is now possible. In a recent interview with a newspaper reporter he predicted that it would in time be as easy "for a subscriber in New York to call up a friend in San Francisco, and to engage him in conversation, as it would be to call another subscriber to the telephone in the city of New York." The service between New York and Boston, by means of a circuit of double copper wire, is now said to be working very satisfactorily; but Professor Bell thinks that all wires in cities should be placed underground; that "the efficiency of the telephone cannot be fairly judged and tested in a large city, where the wires are supported on poles and buildings."

Professor Bell does not believe in the relay system for strengthening the current along the line, but believes that the sound can be so intensified at the receiver as to be heard in the remote corners of a large room. As to this point, he says: "We find this difficulty: When the sound is intensified, it is at the expense of distinctness and of perfect articulation. This fault can probably be corrected in a measure, so that if persons desire it they will be able to sit some distance from the telephone and hear all that comes through the receiver. The transmitter can also be made to convey sounds brought to it from a distance."

AN ANTIQUARIAN'S VIEWS ON EGYPTIAN USE OF IRON.—So very few articles of iron of unquestionable antiquity have been discovered among the remains of ancient Egyptian art, while objects of bronze have been brought to light in abundance, that many have doubted whether iron had been introduced in Egypt before the time of the Ptolemies. But it is very certain that other and neighboring peoples, who never reached so high a stage of civilization as the Egyptians, knew well the manufacture and uses of iron, and it is scarcely possible that the builders of the monumental works of Old Egypt should have neglected so useful a metal. Besides, there are chemical reasons why the iron remains are so few and the bronze relics so many. Yet it would seem that the ancient Egyptians had a marked preference for bronze weapons, implements and ornaments.

COAL IN THE CHICO GROUP OF CALIFORNIA.—Mr. J. S. Diller, of Washington, writes to *Science* as follows: The California Geological Survey reached the conclusion stated by Prof. Whitney, in the preface to the second volume on the paleontology of tho State, p. xiii, that the Tejon group is the only coal-producing formation in California. In the Proceedings of the California Academy of Sciences, Mr. J. G. Cooper has recently published a number of notes on the coals of the State. After remarking (vol. v., p. 385) that the Vancouver coal, and others in that region, are undoubtedly of Cretaceous age, he states that "there is still some doubt as to those of California, which may be partly or entirely above the Cretaceous strata." Last summer, while engaged in the geological survey of the Cascade range, a number of fossils were collected from the coal-bearing strata in Northern California, eight miles northeast of Yreka, on the road to Linkville, Or., and south of the cove at the Great Bend of Pit river, where considerable coal has been found. The fossils have been examined by Dr. C. A. White, who reports that they belong to the Chico group, and thus removes the doubt that some of the coal in Northern California properly belongs to the Cretaceous.

PERSEITE, A NEW SUGAR.—Muntz and Marcano have described a new sugar, obtained from the seeds of the *Laurus persea*, a tree growing in the tropics. This sugar has been observed by Avequin, in 1831, and by Melsons later; but it was by them supposed to be mannite. It is extracted by boiling alcohol, from which it crystallizes on cooling. Analysis gives it the formula $C_{12}H_{14}O_{12}$, isomeric with mannite. Its point of fusion is 183.5°-184°, while that of mannite is 20° lower. It is very soluble in hot—less so in cold water. Even in concentrated solution it has no action in the polarimeter. On adding borax, however, to a 4 per cent solution, it gave a rotation to the right of 0.55°. It does not reduce copper solutions, and is not fermentable. Boiling nitric acid converts it into oxalic acid, without the production of mucic acid. A mixture of strong nitric and sulphuric acids gives a trinitroperseite, which detonates violently by a blow, and spontaneously decomposes.—*Ann. Chim.*

THE BELL TELEPHONE IN CANADA.—The Minister of Agriculture has delivered a decision in the case of the Bell Telephone Company, of Canada, declaring the patent void, for the reason that the company or its representatives had imported the patented articles after 12 months from the date of the patent; also, for not having manufactured in Canada such articles to the extent required by law after two years of existence of their privilege, and also for having refused to sell or deliver licenses to persons willing to pay a reasonable price for the private and free use of the patented invention. This decision will not make so very much difference with the company, as they are in possession of the field, and doing about all the business there is to do, having a well-established plant in every town of importance in the Dominion.

THE LOCOPHONE.—The latest mechanical contrivance for dispatch and safety in the running of railway trains is the "locophone," which has been constructed by Frank B. Taylor, and is now being tested on the New York, New Haven and Hartford road. It is an apparatus resembling the telephone, designed to place each engineer on the road, while the trains are moving at the highest speed, in instantaneous speaking communication with the superintendent of train dispatchers. All the engineers on the road receive the message at the same moment. The circuit is made over the rails.

OLIVE OIL.—If fatty oils are cooled down to 20°, and kept at this temperature for three hours, they assume very different degrees of hardness, olive oil being the hardest. To determine this point the author uses a cylindrical iron rod, one centimeter in length, and ending below in a cone. Upon it is exerted a pressure measured in grammes, until it penetrates into the oil with its entire length. The best olive oil required a pressure of 1,700 grammes, while cotton oil required only 25 grammes.—*Serra Carpi.*

FLEXIBILITY OF LIMESTONE.—The flexibility of itacolumite—a remarkable sandstone existing in Georgia and North and South Carolina—seems to be surpassed by that of a magnesian limestone found at the entrance of the Tyne, in England. This limestone is reported to be so flexible that thin layers three feet or more in length may be bent into a circle while damp, retaining that form on being allowed to dry.

ANTI ALCOHOLIC FOOD.—Dr. Napier's investigations have taught him that macaroni, peas, beans and lentils all work antagonistically to the desire for alcoholic drinks.

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Ore Feeders—Joshua Hendy Machine Works, S. F.
Steam Drill—Scottish Colorado M. Co., Salina, Col.
Stock Broker—Thomas Bartlett, Eureka, Cal.
Delinquent Notice—Fremont M. and M. Co.
☞ *See Advertising Columns.*

Passing Events.

Aside from the information compiled in our usual mining summary, there is little new to note from the mining regions. As soon as the snow leaves our more mountainous districts the prospectors will be out again, as they are already in the milder portions of the coast.

The move to reduce the wages of miners in Idaho still attracts attention. Some of the Miners' Union men have been arrested on charge of conspiracy, because, as the complaint states, they "did, unlawfully and fraudulently and maliciously conspire, with force and arms, feloniously and injuriously to trade, to prevent any and all persons whomsoever from performing labor or mining, either for wages or by contract, or under lease, in either the Queen of the Hills or Minnie Moore mines."

The strike among the iron workers in this city has not yet been entirely settled, though most of the men are at work at the old wages. Some minor differences have still, however, to be settled.

BONDS of the Pacific Rolling Mill Company were sold this week in the Stock and Bond Exchange for the first time. The price realized was 101½.

Miners' Relief Funds.

In Great Britain they have "Miners' Permanent Relief Fund Societies" in the different districts, to aid in the frequent accidents incident to the miners' occupation, such cases having been previously dealt with by public subscription. Mine owners, though they have not contributed the full 20 per cent upon their workmen institution, have helped the funds to some extent, but they have no voice in the management of the fund, or the disposal of its benefits. The main supporters are those for whom the fund is established, namely, the miners themselves. In the term "miners" must be included the managers and other officials, for they are all eligible to membership, and in many cases they are the first to embrace the opportunity to join. From the highest official to the lowest servant, and from the oldest man to the youngest boy, every person in actual employment in or about a colliery, there is no distinction, but upon the same terms they may be admitted into the society. Although men pay only 3d. per week each, and boys 1½d., there has been contributed in the space of the first seven years the large sum of £38,378 13s. 9d., in the West Riding. These results, it must be admitted, are very gratifying as far as they go, but still there are 40,000 persons employed in the coal trade in the mine inspection district referred to, who cannot be placed in the list of those who are the supporters of the society, for they have not joined it, although it is especially designed for them, that they may every one, by its machinery, provide for their own and their families' maintenance in the event of accident befalling them.

From a little pamphlet on the subject we take the following paragraph: From the time that the first of these societies was established in 1862, to the year 1877, when the West Riding Fund began to exist the cause had advanced in the counties of Northumberland and Durham, North Staffordshire, and Lancaster, and Cheshire, until there was a united membership of about 93,000. Of this number 69,000 were in the North, and 23,000 in Lancashire and Cheshire. The remainder represented North Staffordshire, where the system had scarcely got upon its legs. The annual revenue of these three societies was then £63,150, and they held an accumulated balance among them of £76,000. Here, in Yorkshire, we for a considerable time heard next to nothing of or about two out of those three funds; it was with the first named we had chiefly to do. It astonished us not a little to find that at the end of March, 1877 (the month in which we began to enrol members), they had upon their hooks in that one society, 1,668 persons receiving a permanent weekly allowance, thus:—Widows, 314; children, 587; disabled members, 177; aged and infirm, 590; and during the preceding twelve months some 10,000 persons besides these were paid various sums allowed under the rules to members disabled for any period up to twenty-six weeks.

The Iron Workers.

Although in most of the shops the men have returned to work at the old rates, the differences between the men and employers are not all settled yet. At the Risdon works the men in one department have held out against working with one man who worked during the strike, one day, as he had done work which was not satisfactory, and when he went for his pay, was told to go and finish the work properly, which he did. It seems foolish for a hundred or more men to hold out because he was kept on. He only worked one day, and for the purpose specified.

At the Union works, the boiler makers are holding out, because the proprietors desire to keep the men who worked during the strike but these men will probably all start in next week.

The recently organized Mechanics' Union has reorganized and changed the name to the Machinists' Union, with 338 names on the role.

The proprietors state that the situation is not changed at all as regards the reduction in wages, and they will have to employ less men to keep the works going. They think it only a question of time when the present rate of wages will have to be reduced a certain percentage in order for them to compete with Eastern shops.

THE Swiss Bundesrath has rejected the naturalization treaty with the United States.

The State Minerals.

We visited the State Mining Bureau this week, before Mr. Hanks left for New Orleans with the California minerals. The museum, of course, looks dismantled, as 24 of the large, plate glass cases have been shipped, and 40 boxes of minerals. Mr. Hanks has exercised good judgment in the material taken, excluding everything not produced in this State, and taking as far as possible, typical specimens. He is desirous of making the display one of a practical nature, so that people will know what our economic mineral products really are. All ethnological and purely scientific material has been left here.

He has taken specimens of coal, iron, silver, copper, cinnabar, manganese, borax, asbestos, mica, petroleum, gold, and in fact, all such as are of economic importance. The original descriptive labels will be attached, giving name of substance, locality, etc. He has succeeded in obtaining a number of good gold specimens, which go in a special case. In addition to the specimens of ores and minerals, the county and State maps have been taken to display. Mr. Hanks thinks he will have a very creditable showing of the mineral resources of this State, and one which will attract considerable attention. It will show what mineral substances we have here, and what products are utilized.

While absent on his three months' trip, the State mineralogist will visit the gold mines of Georgia and North Carolina. During his absence the museum will be kept open in charge of the janitor, though the business of the office must necessarily cease. On his return, the whole collection will be moved from its present quarters on Sutter street, to the new Pioneer building on Fourth street near Market, where there are better facilities.

Good Mine Pointers.

[Written for PRESS by F. W. S.]

MORE satisfaction can be had out of the crushing of a few tons of ore, from a prospect or mine than can be derived from a dozen assays.

MANY mining camps in districts that produce plenty of fine milling ore and but little smelting ores, have a number of great smelters and no quartz mills. This is often the fault of Eastern companies sending out men, to manage properties, who don't know anything about ore.

IF THE district is one producing free milling ores, encourage and assist the erection of a custom stamp mill. In addition, see to it that the mill is run by an honest man.

A PRACTICAL miner who is thoroughly conversant with the characteristics of a district, can give better and less costly advice than half of the learned cranks, who claim to be geologists *par excellence*.

THE "bonding" of good mines for 60 and 90 days, or longer periods, is a very unsatisfactory thing to do. The advantage is all on the side of the capitalist and the poor miner is very much in the position of: "Heads I win, or tails you lose." It is better to sell outright or retain the controlling interest in the mine.

TRIBUTE mining is a recent and a very good system. Mine owners should guard against being too hoggish in ways of wanting more than the lion's share of the output.

KEEP posted on the general mining laws; also those in force in your own district.

BE generous, yet truthful, in giving items of interest to the editor of your camp paper or to the visiting correspondent of any mining journal.

THERE are hundreds and thousands of ore dumps in as many different districts throughout the mining States and Territories that would add millions to the outputs if custom mills, sampling works or concentrators were erected. Railroad companies could add thousands to their net earnings by giving living rates on ore, to mining men and miners.

ARIZONA contains within her borders nearly, if not quite, 38,000 square miles of coal formation, which is computed to be almost one-half of the coal areas of the United States. The beds vary in size from two inches to twenty feet.

THE Native Sons of the Golden West have petitioned the Legislature to provide the necessities of life for James W. Marshall, the discoverer of gold at Sutter's mill, Coloma.

Electrolysis in Metallurgy of Copper.

Probably the first instance of the application of electrolysis in metallurgy was in the production of "cement" copper in the wet process of treatment. In certain mines the drainage water is often found charged with sulphate of copper, which is the result of the oxidation of the sulphide in the ore. It is from these solutions that the cementation copper is produced. The wet process is particularly adapted to the treatment of the poorer oxidized ores, especially where fuel is scarce. These ores are treated with acid, either hydrochloric or sulphuric, or with ammonia, all three of which are good solvents of the oxides of copper. The precipitation is effected in the copper solution by placing iron in it. The action is the result of electrolysis.

When a piece of zinc or iron is plunged into a solution of copper its greater affinity causes it to combine with the acid holding the copper in solution, and the copper becomes deposited on the zinc or iron. When a portion of this piece of electropositive metal is covered with the electronegative copper, galvanic action begins, the current starting at the electropositive and going to the electronegative. The solution is electrolyzed; the iron is dissolved and the copper is deposited.

After this the action is entirely electrolytic, and it corresponds exactly with that taking place in the gravity cell, where the copper is deposited from the solution and zinc is dissolved by the acid to replace it in the solution. The character of the deposited copper depends on the current, and the current depends on the strength of the solution. In precipitating the copper from the solution, pieces of iron are placed in the large vats containing it. The copper is, as a rule, deposited in a soft, plastic form, whence the term "cementation copper."

Buried Under the Gneiss Drift.

It is a peculiarity of some of the best ledges in the Washington district, Nevada county, now attracting so much attention, that they show no indications of their presence on the surface, being completely covered by the decomposed gneiss which forms here one of the country rocks. This accounts for the fact that these ledges escaped for so long a time the notice of prospectors and others, the placers in the neighborhood having been extensively worked for many years. Owing to the manner in which they are covered up, the discovery of many of these ledges have been purely accidental. The finding of the Selina, one of the richest of their number, is said to have happened in this wise: A miner one day, stopping to rest near the spot, saw a piece of float rock, which, picking up, he proceeded, after the habit of miners, to crush and examine for gold. Finding it rich in that metal, the next thing was to determine where it came from. To this end he ran a number of trenches, one of which struck the apex of a blind ledge. This ledge, prospecting well in free gold, was located and afterwards very thoroughly opened up by means of shafts sunk in the vein matter, besides being traced and uncovered for a distance of about 400 feet. Though not over 16 inches wide on top, this vein has at the bottom of the shafts sunk on it an average width of fully two feet, and it is thought will expand to three times that width in the course of sinking another hundred feet.

This ore is uniformly of high grade, what has been worked thus far having yielded $29 per ton, and it is calculated that the contents of the fissure from wall to wall will mill $25 per ton. Should it do this, the Selina will be one of the big mines of the State. Hoisting works and a mill go up on this ledge in the spring. The Yuba, Eagle Bird, Star and Lindsey, all proven properties, are on the same mineral belt as the Selina, and like it, belong to the system of "blind" leads, being buried under several feet of gneiss debris. Though difficult to find, this class of veins is much sought after, being exceptionally rich in gold.

AT the annual election of the Mechanics' Institute on Tuesday evening the following trustees were chosen to serve for two years: C. F. Bassett, Byron Jackson, C. Waterhouse, James Spiers, George Spauldiog, John Mallon, Joseph R. Wilcox.

WORK has been commenced upon a graded boulevard between Los Angeles and Pasadena.

The Wolf Miners' Safety Lamp.

At a recent meeting of the Manchester Geological Society the Wolf patent safety lamp for miners' use was exhibited and explained. This lamp is constructed to burn benzine. Figure 1, of the accompanying engraving, shows the general appearance of the lamp. For the use of benzine in these lamps the following advantages are claimed, as compared with oil: It will give a much clearer light, of more uniform intensity; it does not produce any lamp black or soot to clog the parts of the lamp, and by reason of its cleanliness a much finer gauze can be employed than is generally used in oil lamps, which considerably increases the safety of the lamp from fire-damp: it is also perfectly adapted to denote the presence of fire-damp, since, when the latter increases to a dangerous extent, the lamp goes out, whilst in the case of so called "black damp," the benzine flame will burn long after an oil lamp would have gone out for want of oxygen. A further advantage in the use of benzine is that it is much cheaper than oil. The novel lighting arrangement of the lamp is illustrated full size in Figs. 2 and 3. By simply inserting into the lamp a priming or percussion strap, which is exploded by the action of a spring operated from outside the lamp, it can be relit about 75 times without reopening, and in the event of the lamp being extinguished from accidental causes the miner is not compelled to travel back to the lamp station.

While this arrangement removes the temptation for any malicious re-opening of the lamp, a locking arrangement is provided, which renders it impossible for the miner to open the lamp except by means of a powerful special magnet kept at the lamp stores for the purpose. Fig. 4 represents a locking device of an older and somewhat modified construction, located in a case or shell attached to the screw ring of the lamp, and Fig. 5 shows the latest and best arrangement, which is inserted between the two parts of the screwed portion in such a manner that no damage or clogging of the parts is possible.

The magnet used in opening the lamp is shown in Fig. 6. To effect the opening of the lamp it is placed upon the movable brass disc attached to the wooden stand. Then the name plate of German silver affixed to the lamps is turned towards the magnet, so that its right-hand part may lie in the recess of the magnet. It will then suffice to turn the base of the lamp somewhat to the left, and hold the top part of the lamp with the left hand, so as to unscrew the lamp by further turning it to the right.

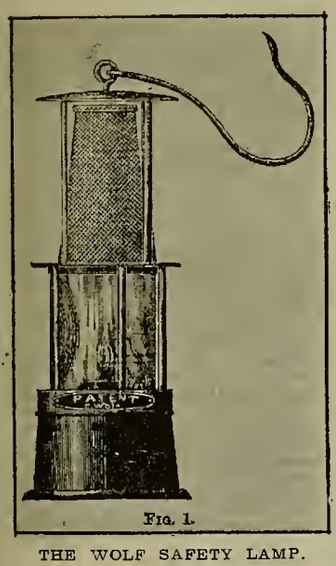
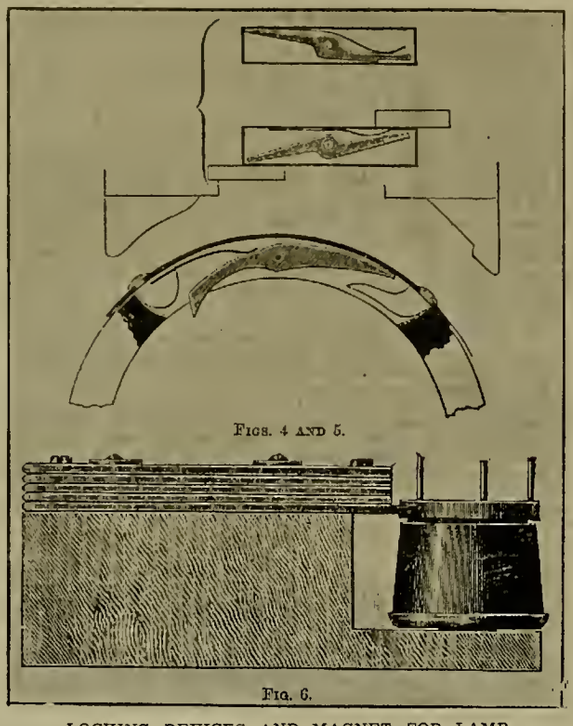


FIG. 1.

THE WOLF SAFETY LAMP.

For charging the lamps with benzine a very ingenious apparatus has been arranged, which is shown in Fig. 7, and which effects the filling of the lamp in an economical manner without risk of danger. The illustration may be described as follows: A is a reservoir of a cylindrical shape, and capable of containing 50 pounds of benzine. It is provided at the top with a screw cover, upon which the apparatus being filled is tightly closed. On one side, at the lower end there is a cock surmounted by a glass vessel. This cock has three ways; by turning the key upwards the glass vessel (B) is filled with benzine, sufficient to charge one lamp, so that it may be used during one shift. If, therefore, the open cup of the lamp be placed under the outlet of the cock, and the key of the latter be turned into a horizontal position, the cup of the lamp will only receive that portion of the benzine which is contained in the cylindrical vessel, while the benzine contained in the main reservoir remains separate. It sometimes, however, so happens that the benzine in a lamp is not fully consumed within a given time, so that the whole of the contents of the glass vessel cannot be held in the cup of the lamp. To meet such an emergency, the filling apparatus is so arranged as to automatically stop the filling operation upon the lamp being sufficiently fed with oil, without any necessity of shutting the cock by hand, so that there can be no overflow or excessive filling. Mr. Budenberg also exhibited an apparatus for efficiently testing each lamp before it is handed to the miner. This consists of an apparatus for generating gas, which is passed into a testing cylinder made of sheet iron, provided with a glass, and containing a pipe, extending upwards in a serpentine shape, and provided within its coils with small apertures. The cylinder also contains orifices or slots at its lower end for the admission of atmospheric air, which can be regulated by means of movable metal rings. When the lamp is to be tested, it is, on being lit, inserted within the coiled pipe in the cylinder, and the gases are allowed to reach the lamp through the small holes in the coiled pipe. Should the lamp be defective the gases will ignite within the cylinder, while if the lamp is in a proper condition the flame of the lamp will be extinguished in consequence of the inflow of gas or manifest the same phenomena as are observed with fire-damp if only small quantities of gas are admitted into the cylinder. The *Colliery Guardian*, from which we take these statements, adds that at the final trials at the Aldwarke Main Colliery, near Rotherham, the Wolf lamp stood the test of a velocity of 51 feet per second; in no case was the glass of the lamp broken, and it was remarked that the flame proved exceedingly steady, the clearness of the light being generally noticed.



FIGS. 4 AND 5.

FIG. 6.

LOCKING DEVICES AND MAGNET FOR LAMP.

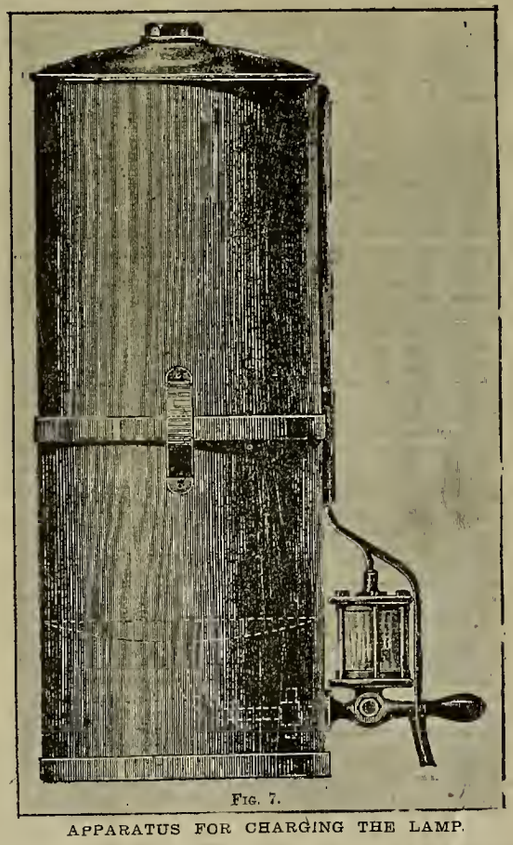


FIG. 7.

APPARATUS FOR CHARGING THE LAMP.

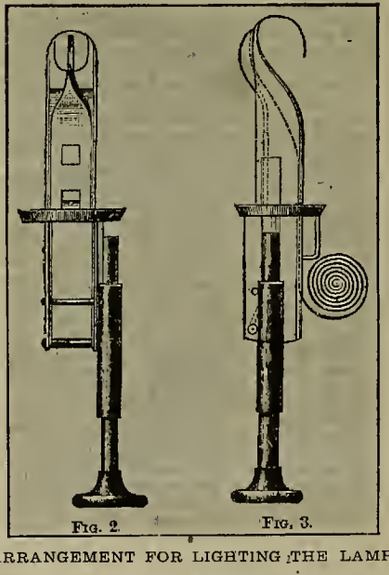


FIG. 2. FIG. 3.

ARRANGEMENT FOR LIGHTING THE LAMP.

Dedication of the Washington Monument.

One of the great events of 1885 is the completion of the Washington monument, and its dedication to the purpose for which it was designed, and for the completion of which a term of 37 years has been required. The dedicatory exercises took place on Saturday, Feb. 21st, that day being accepted at the National Capitol for the celebration of Washington's birthday, as the 22d fell on Sunday. The telegraph brings an account of the dedicatory exercises, which were eminently fitting the occasion.

Last Saturday in Washington was a raw and blustry day and yet a large concourse defied the elements and assembled at the base of the monument. After music by the Marine band the Masonic ceremonies by the Masonic Grand Lodge of the District of Columbia were conducted under the direction of Grand Master Myran W. Porter, in which certain historic relics with which General Washington was intimately connected were brought into use.

Senator Sherman and W. W. Corcoran delivered suitable addresses. Then Colonel Thomas L. Casey, of the engineers, in a few appropriate words, delivered the monument to the President of the United States.

The President read his address in a firm and clear tone and at its conclusion cheers broke forth and were hearty and prolonged.

Afterward there was a grand civic and military procession from the monument grounds to the capitol and the exercises were continued in the hall of the House of Representatives.

In the Hall of the Representatives there was a notable gathering, including the President and Cabinet, the Supreme Court, the Diplomatic Corps, and the Senate. The exercises included patriotic music and orations. At night there was a grand display of fireworks on the Capitol grounds.

The foundation of the Washington Monument was laid July 4, 1848. As just completed it is a hollow shaft of granite faced on the outside with blocks of white marble, and 555 feet high, making it the loftiest structure in the world.

A comparison with the other noted artificial elevations of the world will readily convey to the reader the wonderful dimensions of the monument. The nine highest in the world are as follows: First, the Washington Monument, 555 feet; second, the Cologne Cathedral, 510 feet; third, the great pyramid of Cheops, 460 feet; fourth, St. Peter's Church at Rome; 448 feet; fifth, St. Paul's Church, London, 360 feet sixth, St. Mark's Church at Venice; seventh, the Capitol at Washington, 283 feet; eighth, the Brooklyn Bridge Tower, 276 feet; ninth, Trinity Church, New York, 263 feet.

The apex is a pyramid of white marble, topped with metal and a lightning-rod. The dizzy hight may be reached by an elevator within the monument. The States of the Union, and in many instances cities, as well as numerous foreign countries, are represented in the obelisk, and California did not forget to contribute a memorial stone, as was described in the PRESS last week.

A NUMBER of farmers at Santa Rosa are setting out walnut trees for timber.

Assaying.

Qualitative Tests for Ores.

In Walter Lee Brown's Manual of Assaying, published by Jansen, McClurg & Co., of Chicago, he gives a few simple tests for some of the metals, and acids united with them, as found in ores.

Ordinarily these tests work better on the powdered ore, though sometimes, as will be mentioned, the original rock can be directly treated.

Carbonates.—Place a drop of any strong acid upon the suspected rock; if effervescence (or boiling up) ensues, unaccompanied by any odor, it contains carbonates. This test does not always show well with small quantities of carbonates; try then some of the powdered ore with acid in a test-tube. To confirm the presence of carbonic acid, suspend in the test-tube a glass rod that has previously been dipped in lime-water; the drop on the rod should become turbid or milky, owing to the formation of carbonate of lime.

Place a small sample of the pulverized ore in a test-tube, add to it some nitric acid, a little more than will cover it, and heat till the acid does not seem to dissolve any more of the ore; let cool, after which add as much pure water as there is acid, and shake and filter.

Sulphates.—To some of the filtered acid solution add solution of chloride of barium (or, if lead be present, of nitrate of barium). A white cloudiness or precipitate (which does not instantly form in dilute solutions) shows the presence of sulphates.

Sulphides.—To a piece of the rock, or to some of the powdered ore, add a drop of nitric acid. If sulphides are present in any quantity, a strong odor, similar to that of rotten eggs, will be given off.

Tellurides.—Take a small piece of the ore and place it on the cover of a porcelain capsule, and heat with the inner flame of the blow-pipe for a couple of minutes. Now place a drop of concentrated sulphuric acid on the cover, and let it slide down to the heated fragment. As soon as it touches or approaches very near the ore a beautiful carmine coloration forms, strongly contrasting with the white porcelain. As the latter cools, the color fades. Any white crockery, as a piece of a broken plate or saucer, will do to use in this test.

Copper.—To a piece of the rock on a white porcelain surface add a few drops of nitric acid and stir. Add now an excess of ammonia water. If the mass turns blue or copper, its compounds are undoubtedly in the ore. If the latter contains much copper, a polished knife-blade dipped in an acid solution of it will receive a coating of metallic copper.

Iron.—If, at the same time the solution treated with ammonia turns blue, or even if it does not do so, there appears on the porcelain or in the test-tube, a reddish-brown gelatinous mass, then iron is present.

As further tests for iron, on one part of an old plate put a crystal of sulphocyanide of potassium, and on another a lump of ferrocyanide of potassium (yellow prussiate of potash); now pour on each a little of a hydrochloride acid solution of an ore containing iron; a blood-red coloration with the first-named re-agent, and a magnificent blue precipitate with the second, prove conclusively the presence of iron compounds. Of course these tests can be shown with the filtered solution in test-tubes.

Lead.—Drop a little nitric acid upon a piece of ore supposed to contain lead, then add a little water, and finally a crystal of iodide of potassium. A bright yellow precipitate will form if lead is present.

Silver.—If this metal is in any appreciable quantity in an ore, it will dissolve in nitric acid (excepting the chloride ores). To the acid solution, add a little hydrochloric acid, solution of common salt, or even a dry grain or two of the latter. A curdy, white precipitate of chloride of silver is thrown down, which is not soluble in water (as is chloride of lead on the contrary), but dissolves easily in ammonia water. The precipitate turns black on being exposed to light.

As stated above, chloride ores do not dissolve in nitric acid; therefore when they are suspected to be present, put some of the powdered ore into a small bottle, pour in a small quantity of very strong ammonia water, cork up the bottle and let it stand for a few hours. Then add, in slight excess, nitric acid. The white precipitate of silver chloride will at once come down if there is any in the ore.

The best test for gold is the fire assay. To learn the colors and appearances of the tests above given, try them on the following substances:

Carbonates	Bi-carbonate of Soda.
Chlorides	Common Salt.
Sulphates	Sulphuric Acid.
Sulphides	Copper or Iron Pyrites.
Tellurides	Any Telluride Ore.
Copper	Copper Wire.
Iron	Nail or Wire.
Lead	Sheet Lead or Galena.
Silver	Silver Foil and Horn Silver.

Consult the books on qualitative analysis for further information or tests.

DAILY YIELD INCREASING.—The daily average of ore taken from the Yellow Jacket, Crown Point and Belcher is largely on the increase. These three mines are now producing over 500 tons of ore per day. A train of 70 cars loaded with ore from the above three mines leaves Gold Hill every day for the mills on the Carson river.—*Virginia Chronicle.*

Minerals Accompanying Tin-ore in the Black Hills.

The following paper, by Professor Charles A. Schaeffer, of Cornell University, was read before the American Institute of Mining Engineers:

Several months ago, some specimens of the minerals occurring at the Etta tin mine, Dakota, were received at the laboratory of the Cornell University. On examining the heavy brownish-black portion, which I presumed was the tin-stone, I was surprised to find only a faint indication of tin. Further investigation showed the mineral to be tantalite. On searching carefully all the fragments received, a considerable quantity of that mineral was found, and only a single streak of cassiterite, which was attached to a mass of spodumene.

Another lot of specimens, from the same locality, consisted of samples of the greisen, some garnets, and a quantity of "stream-tin." The latter sample weighed about 500 grammes, of which about one fourth consisted of small, pinkish garnets, averaging about the size of a grain of mustard-seed. The remainder comprised a lot of rounded brown pebbles, averaging in diameter a quarter of an inch. These were carefully examined with the blowpipe, and of 30 pieces six proved to be tin-stone; one, the largest of the lot was hematinte; and the rest were tantalite. No wolfram was found in any of the specimens, and I think it is a fair inference that the heavy black mineral to which Professor Blake alluded in his paper as "apparently wolfram," is tantalite.

An analysis of the tantalite gave the following results:

	Per cent.
Tantalic oxide	79.01
Stannic oxide	0.39
Ferrous oxide	8.33
Manganous oxide	12.13
	99.86

Specific gravity, 7.72.

So far, I have been unable to find the least trace of columbic or tungstic acids, or of any of the rarer metals. The Dakota tantalite is thus much simpler in composition than the mineral from Alabama, which, according to the late J. Lawrence Smith, contains tungstic acid, as also oxides of zinc and copper in small amounts.

Pressure of other work has prevented me from analyzing additional specimens of the mineral; but I think it highly probable, from the fact that the color of the powder differs more or less in the different specimens, that they would give results varying somewhat from the above figures.

A third lot of minerals from the same locality, received from a friend who obtained them at the office of the Harney Peak Mining Company, in New York city, presented precisely the same appearance as the specimens that I had received directly from the Etta mine, except that in the massive specimens the tin-stone was present to a very encouraging degree, though the tantalite was by no means absent.

In a report made to the above-named company, by Professor Gilbert E. Bailsy, the following passage occurs: "No titanic acid, wolfram, sulphur, arsenic, or other injurious substances were found in the ore."

So far as my knowledge goes, there may be no wolfram present, but there must be, instead, a very considerable amount of tantalite accompanying the tin-ore. As to arsenic, the first lot contained two large lumps of scorodite,—remarkably good specimens,—with here and there kernels of leucopyrite. Further, one of the massive specimens of tantalite contained two little cavities which were filled with olivenite. From this it seems that arsenic does occur in at least three of the minerals which accompany the tin-ore. By proper concentration, however, it will be a very simple matter to remove the most of these arsenical minerals from the ore. But how to separate the apparently large amount of tantalite from the tin-stone is a matter which will, I believe, prove puzzling to the wisest metallurgist.

ABOUT NEW RIVER.—"Would you go to the New River mines if you were in my place?" asked a young fellow of this writer this morning. We answer: If we had nothing to do here and had the money to go to New River on, and enough of it to bring us back in case that we did not like the way things looked after we got there, we should go to New River. We would not throw up even a small business so as to enable us to go to new mines. New River is not so very far away, and it is in a mining country. It has the quartz, and the country rock is about like that of Grass Valley district. There will be some paying mines in New River; nothing big like the Comstock. Travel is good for a man, and one who is idle and can pay his way had better do some traveling. Of course there are numbers of "Old Prospectors" who will write to the newspapers that New River is all a humbug. The "Old Prospector" used to write that way about the Comstock. That same "Old Prospector" is the bane of every established mining camp, for he is the fellow who is telling capitalists not to invest in mining. Of course "Old Prospector" is against any new ventures. For the good of the mining business generally "Old Prospector," who writes to the papers, ought to have died years ago, but he never will die. We would chance a reasonable amount on a trip to New River if we were the young man who asked us about it. The trip will do him good.—*Grass Valley Tidings.*

The Kind of Men Miners are.

The condition of the ore miners of Colorado is vastly superior to that of the same class of people in other mining sections. Wages are remunerative, because there is a good margin left over the cost of the necessaries of life. Mining here may be regarded as skilled labor since the price paid for such work exceeds the compensation received for many kinds of labor properly classed as skilled. Miners' wages, as a rule, are higher than clerkships, even drug clerkships, and on a par with the salaries earned by the sleek gentlemen who concoct exhilarating beverages behind gorgeous sideboards. Blacksmiths and watch-tinkers command somewhat larger pay, but do not have corresponding social rank. No form of manual labor equals that of mining when both remuneration and social standing are considered. There are numerous instances in which the poor miner of last year is the capitalist, legislator or society favorite of the present year. The Colorado miner springs from clay susceptible of the highest polish, at least in his own estimation, and we find him springing continually from obscurity and ignorance to prominence and position hitherto supposed to require years of patient and persistent preparation. The wonderful transformation of the crawling caterpillar into the brilliant-hued butterfly sinks into utter insignificance before the lightning changes of the honest miner to the guilded shapes he is constantly assuming. It is not known whether the butterfly ever boasts that he was once a repulsive worm, but it is an established fact that the miner never reaches a position so exalted that it prevents him from referring with pride to his chrysalis familiarity with the pick and shovel. There is a spirit of hopefulness and ambition associated with mining that begets manliness and independence of character beyond that of any other calling in which manual labor is as important a factor. It is intrinsically an attractive labor, out of which longer persimmon poles and mightier levers may be rested by the hands in a day than brains could evolve in a life time, and hence we find in the business more brainy than brainless devotees. It will be a national calamity when miners wages are reduced and the honor whether merited or not, that attaches to this form of labor is unrecognized. In contrast with the honorable standing and happy condition of our own miners let us place the lot of the toiling, helpless masses who work in the mines about Freiberg, the mining and smelting center of Germany. There the miners and smelters eke out a miserable existence. They generally have large families and receive 25 to 50 cents a day, living chiefly on potatoes, rye bread and chicory, which is a substitute for coffee, and indulgs in the luxury of meat only once a week. They look pale and emaciated and labor often at depths of 2,000 feet below the surface of the earth. The children of such men are sad, expressionless and often deformed specimens of humanity. How they would brighten up and be happy if their food was of the quality used by our miners, even with no other amelioration of condition and prospects. Loyalty, liberty, liberality and good government will grow and strengthen and be upheld always when the masses have the hopes, aspirations and instincts possessed by our honest miners.—*Denver Tribune-Republican.*

Mines in Sandstone.

A recent dispatch says that the reports of new and rich gold strikes in the Henry and Elk mountains, near the Colorado river, San Juan county, U. T., are abundantly confirmed by the receipt in Salt Lake of numerous and exceedingly rich ores, carrying free gold, telurium and native silver. The outlook is that there will be a stampede of miners and prospectors from the mines of Northern Utah to the new discoveries. The ore runs from $250 to $9,000 to the ton.

A miner, who doubtless understands the character of the alleged finds, and who has evidently a fair knowledge of the formation of the section where the strike is said to have been made, writes to the Salt Lake *Tribune* and advises prospectors to go slow on the boom. He says: "Silver mines in a sandstone formation, in mining parlance, are very treacherous, and spotted similarity of ores is in criterion for determining the value of ores as in other formations. So far as I am informed, Silver Reef is the only place where mining in sandstone has been a success, and the pay portion of that district is confined to a very small limit.

East and northeast of Silver Reef, and south, southwest and southeast, are beds or reefs of silver-bearing sandstones, similar in almost every characteristic to the Silver Reef ores, except that they carry only a small per cent of silver—not enough to pay for working.

"As a rule, so far as my observation goes, the more copper you find in the sandstone ores the less silver you will find. Still, this rule may be reversed in some new locality. The silver sandstone mines near the Lower Crossing of Price river boomed for a short season and are now almost forgotten. Then we have right here, within five or six miles of this city, beds or reefs of silver-bearing sandstone, strongly impregnated with copper, but carrying a very small percent of silver. I am informed by men who have traveled and prospected over a large portion of Southeast Utah, Southwest Colorado and Northern Arizona, that the country is full of these silver-bearing sandstone beds. A few years ago there was a stampede to the Pahreah country, east of Silver Reef, after silver sandstones, but they didn't pan out worth a cent. It turned out to be a premeditated fraud, gotten up to make a few dollars before the thing could be exposed.

"I hope the sandstone, copper-gold-silver ores of White Canyon will prove as rich as some of the assays indicate. Nothing would do Utah so much good as to have a big mining boom based on intriusic merit—one that would attract capital to the Territory.

"I would advise miners to go a little slow on this new sandstone region, and await further developments. If the mines are as spotted as the assays of the hand samples indicate, there will be many blanks and few prizes."

A GOOD WORD FOR THE SILVER DOLLAR.—The New York *Sun*, in answer to the question "Will the silver dollar work injustice," says that it will neither cause a financial crash nor produce stringency nor injure labor interests. The only serious question is that regarding contracts now existing, made upon express or implied assumption that they were to be fulfilled in gold. The *Sun* takes sides with the silver advocates as to the relative value of gold and silver when gold contracts were made, arguing that silver dollars have not depreciated, but that gold has advanced, and instances this general cheapness of raw materials and the necessaries of life, compared with their cost seven years ago. Much of the decline, no doubt, is due to increased production and an improved process of manufacturing, but the fact remains that 85 or 83 cents in gold will buy more food, clothing and other articles of daily use than $1 in gold would have bought in 1878. The man who lent gold then and gets it back now is really getting more than he parted with. Statistics which show the decrease of gold production and its increased absorption in manufactures also show that the silver production has remained stationary at about $100,000,000 annually since 1879.

GO PROSPECTING.—It would seem that just now is an opportune time for the further development of the many idle claims in this mining district. Many of them have had enough work done upon them to demonstrate the existence of ore, and that in paying quantities. Here would be an excellent chance for many of those here who are seeking work to lease or enter upon a tributing proposition to further develop any one or more of the better properties. The latter plan is a feasible one, now that milling can be done much cheaper than in past years. Any man, who is any judge of the ores of this district, can make his board, which is more than striking the superintendent or foreman for a job every day will bring him, and has the chances of finding something that will pay him much better.—*Candelaria True Fissure.*

GOLD AND SILVER.—The attitude of the East on silver demonetization has caused many of the miners of Colorado to seek the gold fields. This fact has been and will be a good thing for Clear Creek, Boulder and Gilpin counties, as many old miners have turned their faces toward these old mining districts. The gold belt of the Rocky mountains, beginning northeast of Boulder county, passes to the southwest, through or near Nederland, Rollinsville, Black Hawk, Central, Russell, Idaho Springs, Dumont, Lawson, Red Elephant mountain, Covods mountain, Empire City, North Empire, Georgetown, and so on to the northwest. This belt will witness much activity during the coming few years.—*Georgetown Courier.*

THE EXCELSIOR MINE SUIT.—The famous suit of Frank T. Butler, assignee for 11 holders of stock of the Excelsior Water and Mining Company of California, against James B. Haggin, Director of the Company, and others, has been concluded. Judge Van Brunt dismissed the suit as against the others. The court in its charge said it was for the jury to determine whether the purchasers bought the stock during the time Haggin was a Director, and if they bought it, believing it to be dividend paying. The jury gave plaintiff a verdict for $6,801. The case will be appealed. A large number of experts testified in this suit.

A WOOD RIVER MINERS' UNION publishes the following card: We will sustain miners' wages within the limits of Bullion and Bradford mining districts at $4 per day, in United States gold coin or its equivalent, and will firmly and perseveringly oppose any effort on the part of any person or persons to reduce the miners' wages to less than the above-stated rate. We caution miners who may hear that miners are in demand here, not to come until the difficulty now existing between the mining companies and the miners at Bradford is settled.

AT QUIJOTOA, Arizona, grading has been commenced for a mill, and will be pushed along as rapidly as possible. The contract has been let to William Tweed for hauling the mill from Horshaw. The well in the valley is down 300 feet; water is reached at a depth of 400 feet. They expect to have an abundant supply within three weeks.

ENGINEERING NOTES.

The Strength of Brickwork.

The torn aed ragged keyless arches and baseless walls of ruined abbeys, the partially demolished houses on the track of some new railway or road, and many other equally trite instaeces might be cited as standing evidences of the truth that good masonry or brickwork will resist with energy, not only crushing, but breaking across, and tearing, twisting, or shearing asunder. No wouder, then, if the first element alone be included in the calculation, that many a brick structure whose fall has been prophesied refuses to acquiesce in the false laws of the prophet. The prophet's dictum might probably be justified by the result if full work were imposed upon the structure before sufficient time had been allowed for the full development of all the powers of brickwork, but the experienced practical builder never loses sight of this condition, but by the use of cement in some places, and of props and supports in others, gives the brickwork the necessary temporary aid, and so insures success. Many cases of this class are to be met with in small country towns, where the town hall is carried upon arches and piers in order to afford space for a market underneath. These buildings do not tumble down, and as country builders reproduce the type coetinually, it is by no lucky chance that they escape. The country builder is wiser than his critics: he does not aim at making an arch except in appearance, for he has no abutments, but he takes special care to put his work together in such a manner as to insure his getting a serviceable and reliable brick beam.—*Eclectic Engineering Magazine.*

Water Power for Cities.

In London the plan of distributing water power in pipes for manufacturing purposes, running lathes, elevators, etc., is now in successful operation. The franchise is owned by the General Hydraulic Power Company. The water is taken from the Thames, filtered through sponge filters, then forced through the pipes by steam power. There is a pressure of 700 pounds to the inch in the mains. The mains which now measure in the aggregate seven or eight miles, are cast iron pipes six inches in diameter; yet they are cast in nine-feet lengths, and are tested to 2,500 pounds per square inch at the works. The joints are turned and bored spigots and sockets, and are made tight with gutta percha rings, the necessary pressure being obtained by 1¼-inch bolts passing through the lugs on each pipe. As each section is laid, the water is admitted to test the joints; and after that, if they are tight very little more trouble is experienced. Stop valves are inserted every 400 or 500 yards, and by their aid the position of a leak can be located within that distance, after which it is easily found. The financial success of the company is no longer a matter of doubt. Since January 1st of the present year, the amount of water delivered has increased 40 per cent and would be much greater if all the intended consumers had their machinery in place. The charges for power are based upon a minimum payment of 25s. per quarter for each machine, and a sliding scale for the water, which is measured by meter as it is exhausted. In many cases the cost of lifting by the company's power is as low as a half-penny per ton lifted 50 feet high.

FROM LONDON TO BOMBAY BY RAIL.—He is a bold man, says "Invention," who in these times should object to any engineering scheme that it is impossible; being the newest project of rapid traveling is sufficiently startling, being none other than a railway route from London to Bombay. The idea emanates from a number of English and French engineers acting in concert, and even the smallest details are said to have been carefully worked out. The whole of the journey will be accomplished by train save the passage of the Channel and the crossing of the straits of Gibraltar. From Tangier the railway would run across Morocco and make a junction with the Algerian lines, afterwards continuing by Tunis and Tripoli to Cairo. Thence the line would continue along the Euphrates valley and the shore of the Persian gulf to Karrachee, the extreme westerly point of the Indian railway system. It is not surprising to hear that the cost of the undertaking would be ten millions sterling. Quick trains, three of which would be run weekly each way, would cover the distance between London and Bombay in nine days, while slower trains starting daily would take a day or two longer.

COTTON COMPRESS.—Columbus, Georgia is to have a cotton compress to facilitate shipments of cotton from that point. It appears that 24 bales of country packed cotton fills a car, while as much as 50 bales of compressed cotton can be placed in one. The severe compression of cotton greatly reduces the cost of its transportation; but it also seriously injures its quality.

THE HUDSON RIVER TUNNEL has not been abandoned, as some have supposed. Work was temporarily suspended chiefly on account of the death of one of its chief promoters—Trenor W. Park. Work will be resumed as soon as the present general business depression has passed away.

USEFUL INFORMATION.

TO BONE A TURKEY.—It is not very easy to bone any bird from written directions, and a turkey is rather a serious thing to spoil. There are two ways of boning. Knives are sold for the purpose, but a sharp pocket knife will do. Lay the bird on its breast, and cut through the skin along the middle of the back. Keep the knife always close to the bone, and cut away the flesh on either side, turning it back as you go. Cut through the joints of the leg and wing bones, and keep cutting till you have separated the breast-bone, when the whole of the body will come out intact. The legs and wings are rather more difficult, but the only thing is to cut very carefully, and on no account to pierce the skin, turning the skin and flesh inside out, like a stocking, as you go along. The legs should be cut off at the first joint, and the last bone of the wing is sometimes left in. When all the bones are out, fill the bird with tongue, stuffing, chestnuts, or whatever else you may have, remaking it, as far as may be, into the shape of an unboned bird. Some persons prefer to lay it flat and turn it round, tying it with string. The other way is to make an incision at the back of the neck only, just as if the bird were to be drawn, and to take all the bones out there, turning the skin back from the body, as directed above for the limbs. The slits, whether intentional or accidental (and a beginner will probably have a few of the latter) should be sewn up with fine cotton.

CURIOSITIES OF MISNOMER.—Black lead is not lead at all, but a compound of carbon and a small quantity of iron. Brazilian grass never grew in Brazil, and is not grass; it is nothing but strips of palm-leaf. Burgundy pitch is not pitch, and does not come from Burgundy; the greater part of it is resin and palm-oil. Catgut is made from the entrails of sheep. Cuttle-bone is not bone, but a kind of chalk once inclosed in the fossil remains of extinct species of cuttle fish. German silver was not invented in Germany, and does not contain a particle of silver. Cleopatra's Needle was not erected by the Egyptian Queen, nor in her honor. Pompey's pillar had no historical connection with Pompey in any way. Sealing wax does not contain a particle of wax, but is composed of Venice turpentine, shellac, and cinnabar. The tuberose is no rose, but a species of polyanth. The strawberry is no berry, but only a succulent receptacle. Turkish baths did not originate in Turkey, and are not baths, but heated chambers. Whalebone is not bone, and is said not to possess a single property of bone.—*Providence Journal.*

ANCIENT BRICK BUILDING.—Professor Adler, at the recent opening of the new Technical High School in Berlin, gave an interesting account of the history of brick building in Germany. The Roman method was known more especially at Treves and Cologne. A brick stamp of the year 630 bears the name of Bishop Arbogast of Strasburg. In a great many of the later buildings bricks from older structures were used. From the middle of the tenth century brick appears as a decorative material in architecture, especially in tufa stone buildings on the Lower Rhine. Roman civilization had made but little progress, however, between the Rhine and the Elbe, and the brick manufacture was entirely unknown for centuries, stone and wood only being used. The oldest brick building in Denmark is the cloister at Sorce, on the island of Zealand, (1151 A. D.) Most of the brick building in eastern Germany was introduced by the Dutch during the twelfth century, but the Roman system of working was followed.

EXUDATIONS ON BRICKWORK.—According to the *American Architect*, the simplest and least expensive method for removing saltpeter exudations from brickwork, when the efflorescences are in positions where the sun and wind do not have free access, is to wash it off with diluted hydrochloric or common muriatic acid of commerce. This acid is very inexpensive; 25 cents worth would be sufficient to clean a front of 20 feet wide by 60 feet in hight, if such a front was totally covered with the objectionable exudation. About one-half pound of the acid is used with an ordinary pailful of water, the application being made with a sponge, which can be held in the naked hand or attached to a stick to reach the spots, as may be desired. When the efflorescences have been thus removed, it is perfectly useless, in the present state of knowledge, to attempt to stop a reappearance, for when circumstances are again favorable, the saltpeter exudations will promptly spread themselves over the walls.

JAPANESE PROGRESS.—Not ten years have elapsed since the first paper mill was started in Japan, with the latest appliances of American and European machinery, and now we are told that there are a dozen mills in operation in that country. This illustrates the progressive character of the Japanese people and the intelligence which has been quick to seize upon advance in industrial art. We are told, too, that the Japanese paper makers are well up in their trade and do not need the aid of foremen of foreign birth. The Osaka mill reimbursed the money invested in it in three years, and in 1884 the Oji mill paid a 17 per cent dividend on a capital of $565,000. With all this, the Japanese imports of paper from the United States and Europe are steadily increasing. The example of Japan has incited the Chinese, and it is reported that a paper mill is to be built at Shanghai.

IMPORTANT IF TRUE.—A wonderful piece of news comes from Washington. It is as follows: While looking after the interests of the western water-ways, George L. Wright has had gazetted a patent which is said to contain a bonanza. It almost annihilates the chief expense of producing electric power. Running water does the work, and the invention covers the plan for storing the force until it is needed. A bill is now before the House, with a favorable report from the committee on commerce, providing for a trial of this wonderful idea upon the rivers. When it is stated that Mr. Wright's machinery, placed in the river, will, with only the current for power, generate the electricity to light St. Louis, some idea of its practical utility, as seen in the mind's eye, will be formed. With these machines scattered along the river, worked automatically by the current, the channel may be lighted from St. Paul to New Orleans like the avenue of a city. They can be put on boats, and the light produced without any engine. The machine can run all day by the flow of the water, and be storing up the power for use at night.

NEW USE FOR OLD SHOES.—Even old shoes are valuable. They are cut up in small pieces, and these are put for a couple of days in chloride of sulphur, which makes the leather very hard and brittle. After this is effected, the material is washed in water, dried, ground to powder, and mixed with some substance which makes the particles adhere together, as shellac, good glue, or thick solution of gum. It is then pressed into moulds, and shaped into combs, buttons, knife handles and many other articles.

A CONSIGNMENT OF BUMBLE-BEES.—Probably as curious an article of export as is often carried in an ocean steamer, was lately taken out to New Zealand. It consisted of a consignment of "bumble-bees." At present, clover does not "seed" in that country, though it grows readily, because there are no humble-bees to fertilize the flower. The importer hopes that the bumble-bees will save him $5,000 dollars a year on clover seed.—*Ex.*

GOOD HEALTH.

A Cause of Sudden Deaths.

The sudden death from apoplexy of the Hon. Schuyler Colfax, ex-Vice-President of the United States, at Mankato, Minn., on the morning of January 13th, while apparently in the enjoyment of the best of health, should admonish all of the great danger incurred by exposure to extremes of temperature. It appears that Mr. Colfax walked from one depot in Mankato to another, three-fourths of a mile distant. He faced a bitter wind all the way, and the thermometer was 30° below zero. Reaching his destination, he immediately entered the waiting-room, where, presumably, the temperature was at least 70° above zero, possibly even warmer than that. The vital powers could not withstand a sudden variation of temperature of 100° or more, and Mr. Colfax in a few minutes dropped dead.

A gradual change would have probably produced no harmful results, but an instant change from an atmosphere highly charged with oxygen to one only moderately impregnated with that vitalizing constituent, proved fatal.

Most people have experienced, at one time or another, a faint, suffocating feeling on going suddenly from extreme cold to extreme heat, and have never probably guessed how near they were to a stroke of apoplexy.

The transition from extreme heat to extreme cold is often equally fatal in its effects, though in a different way and not so quickly.

It has been demonstrated that no living room should be kept warmer in winter than a temperature of 70°. Sixty-seven degrees or 68° is probably still better. Most houses are kept much warmer than this, the thermometer often indicating 75°, 80°, and even 85°.

What is the result of this extreme heat?

All the minute pores of the body, to the number, it is estimated, of several millions, expand, open their tiny doors, as it were, and permit the waste of the body to pass out by means of perspiration.

Suddenly subject this body, with its millions of little doors wide open, to a temperature of say 20 or 25 degrees above zero, or even colder, and what is the result? Instantly the millions of pores close up, the perspiration ceases and the waste, a moment before passing out by these wide-open doors all over the body, is compelled to find another outlet. It is thrown back upon itself, as it were, and upon the internal organs. The kidneys are called upon, without a moment's warning, to perform almost superhuman work, and do it partially, but often at the expense of becoming diseased. The waste material that cannot find an outlet through these organs and other channels, clogs the blood, and you find yourself down sick with a cold, and, perhaps, inflammation of the kidneys into the bargain, or possibly that terribly fatal and swift-working malady, pneumonia, may supervene.

Every house should be provided with one or more thermometers, and it should be the business of somebody to see that the temperature never rises much above 68° or 70°.

Families that are careful in this respect will have far less colds, and other ills resulting from colds, than where this simple precaution is neglected.—*Exchange.*

BEAUTY AND ITS PRESERVATION.—Grief, as well as all agitation of the mind, is detrimental to beauty. Too much excitement of the tear ducts dims the eyes, and traces of the working of the passions are left upon the face. Those persons who are happily gifted with an equable temperament grow old much less quickly than those whose dispositions are the reverse. Girls sometimes bit and suck their lips in order to make them red. It is a foolish habit which may injure their shape. Dryness and crackieg of the lips, as well as "fever sores," are usually due to a disordered stomach. Persons liable to such troubles should apply to their lips every night a salve of glycerine mixed with lard, which is the best application known for that purpose. A fever sore begins as a hot, painful lump on the lip, soon changing into a blister. It is both annoying and disfiguring. The sore should never be rubbed or scratched. At the very outset it should be touched with this preparation every few hours: Carbolic acid, ten drops; glycerine, a teaspoonful, attar of roses, two drops. Beauty, it is said, is only skin-deep. Accordingly, she who would be beautiful should pay the utmost attention to the rules above set forth. Beauty is not, however, in reality skin-deep; it is only scarf-skin deep, as deep as the epidermis. Blister a negro and when the epidermis comes away you will find the spot is white. The epidermis contains the coloring matter which distinguishes the negro from the white man, the blood from the brunette. In this brief article the writer has only treated of skin troubles which may affect those who are in health. When affections of the skin spring from constitutional disorders, constitutional remedies must be sought.

THE MEDICAL USE OF EGGS.—For burns and scalds there is nothing more soothing than the white of an egg, which may be poured over the wound. It is softer as varnish for a burn than collodion, and being always on hand can be applied immediately. It is also more cooling than the "sweet oil and cotton" which was formerly supposed to be the surest application to allay the smarting pain. It is the contact with the air which gives the extreme discomfort experienced from ordinary accidents of this kind; and anything which excludes air and prevents inflammation is the best thing to be applied. The egg is also considered one of the very best remedies for dysentery. Beaten up lightly, with or without sugar, and swallowed at a gulp, it lends by its emollient qualities to lessen the inflammation of the stomach and its intestines, and by forming a transient coating for these organs to enable nature to assume her healthful sway over the diseased body. Two, or at most three, eggs per day would be all that would be required in ordinary cases; and since the egg is not merely a medicine, but food as well, the lighter the diet otherwise, and the quieter the patient is kept, the more rapid and certain is the recovery.

HOW TO SOFTEN THE HANDS.—"How am I to whiten and soften my hands?" is a question that is asked by a correspondent. Doubtless one way to do this is to avoid the work which has made your hands rough and dark, but often this work may be done with such care that the hands will not be injured. If one is obliged to sweep her house, to empty the ashes from the grate or stove, and to wash dishes, she cannot expect to keep her hands as white as idle hands are; but if she takes the precaution to put on a pair of gloves or mittens when she sweeps and is doing dusty work, one cause of rough skin will be removed. Then there are preparations which one may use. Powdered borax is excellent to soften the skin. A mixture which is said to be sure cure for undue perspiration of the hands is made of a quarter of an ounce of powdered alum, the white of one egg, and enough bran to make a thick paste. After washing your hands, apply this; let it remain on your hands two or three minutes, and then wipe off with a soft, dry towel. Lukewarm water is better than hot or cold, if the skin is inclined to be tender or chap.

FRECKLES.—The following is a celebrated remedy for freckles and may be compounded at home. Best English mustard powder, a tablespoonful; lemon juice, enough to make a thin paste; oil of almonds, a teaspoonful. Mix them well, and apply in a thick plaster night and morning until the skin smarts; after a few days the scarf skin should loosen and the freckles disappear. After they have gone the surface should be washed several times daily with a solution of borax, and the patient should not venture into the open air for some days.

A NEW REMEDY FOR CANCER is alleged to have been discovered in a Brazilian plant, which those who remember the story of cundurango will wait to see more fully tried before pinning their faith upon it. Some wonderful reports of its efficacy in cancerous tumors have been reported by Brazilian doctors. The remedy has been brought to the knowledge of our State Department by our consul at Pernambuco.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

NEW MILL.—Amador *Dispatch*, Feb. 21: Mr. S. G. Shugert went below last Wednesday morning for the purpose, we understand, of purchasing the necessary machinery for erecting a new 20-stamp quartz mill on the Amador Queen mine. The Lincoln mill at Sutter creek has been temporarily closed down, owing to the scarcity of rock in the mine.

SUTTER CREEK.—Cor. Amador *Ledger*, Feb. 21: The rock now being extracted from the Eureka is being saved from the mill, and the dumps are already nearly full. The mill will probably be started in a few days, and the important question of the paying character of the ore definitely settled. The Lincoln mill and mine closed done last Friday, on account of the exhaustion of the ore in the level. A contract was to have been let last Monday for delivering 62 tons per day from the old Lincoln dump pile to the mill. Twenty stamps of the mill will be kept running on this. It is thought that it will take from two to three months to run through the entire pile. The contract taken by Sutter creek boys some time ago to sink 1,000 feet on a mine across the Consumnes river, in El Dorado county, has been completed. George Liccovich, one of the men, got back last week, and says the rest will be down as soon as they can get their money. When this will be, however, is very uncertain, as everything is in litigation, as a number of contractors who left before much was accomplished, have sued the others for their wages, and until this is settled there will be no final settlement by the company.

MISCELLANEOUS.—A contract was let last Monday by Messrs. Shugert and Morgan, for running 100 feet south on the 150-foot level of the Amador Queen mine at Murphy's Ridge. The contract was awarded to W. Doyle and J. C. McNamara at $3 40 per foot, contractors to furnish candles, powder and fuse. The tunnel is to be 5x6 feet in the clear. The contractors entered upon the work Thursday morning. The contract for re-opening the old shaft of the Gover was not let, all the bids received being considered too high. The undertaking was a difficult and risky one to be tackled on the contract plan, as it is impossible to tell what amount of work is involved in placing the shaft in a serviceable condition.

Inyo.

QUARTZ.—Inyo *Independent*, Feb. 21: It is reported that there was quite an excitement at Bishop Creek, caused by the recent discovery just west of town of a large and rich vein of quartz. Everybody was going to take a look at the new find,

Mono.

THE STANDARD CON.—Bodie *Free Press*, Feb. 19: In a long conversation with manager A. Pettibone, our reporter is pleased to state that the interest in the Standard Con. has not abated in the least. They appear to have unlimited confidence in Mr. Pettibone's experience as a practical miner and have invested him with full power to carry out any plans he may suggest. The low-grade proposition will be solved to the best advantage and then attention will be directed to the practicability of sinking a new working shaft, exploring and testing the lower level, etc. No reduction in wages have been contemplated by the new management, but the curtailing of expenses in the salaries and at the different offices has been general.

Napa.

SILVER MINE.—*Calistogian*, Feb. 20: We visited the Grisby and Johnson Silver Mine in King canyon, about three miles from Calistoga. J. J. Johnson, one of the owners, was present and accompanied the party about the property, and kindly answered the numerous inquiries made. The Grisby & Johnson property embraces three or more claims, in two of which (Easley and Old Discovery) all the work worthy of mention has thus far been done. The Easley claim is the oldest location, and was first taken up in 1876, by W. H. Easley. This claim includes the ground in which Thomas H. Reynolds engaged in work a few years ago, and in which Judge Hartwell also labored and disposed of his then available cash. Their work, however, was done mainly a short distance from the vein that now attracts so much attention on account of its extent and richness, and which was in part first cut in 1881. The course of the Easley vein is a little east of north. It dips to the west, and its inclination is comparatively slight at the present depth of working. Its average width is eleven feet. The Old Discovery claim adjoins the Easley on the east side. The vein of ore found in this ground averages twelve feet in width so far as known, though it has been prospected but little. It has about the same course and dips as the other vein, but is richer. In addition to these it is said that another important vein of ore extends the length of one of these claims, but, if so, it has not yet been found by the owners of the property; though their ground has been fully prospected thus far. In the winter of 1881, the Bounsall brothers commenced work on the left side of the canyon, which is quite narrow there, and ran a tunnel to the west, and into the hill a distance of 100 feet or more, through extremely hard rock. At this distance, and over sixty feet below the surface, they cut the Easley vein, and found plenty of rich ore. It was this discovery that in part settled the question as to whether good silver ore in paying quantities could be found here and away from Mt. St. Helena. Soon after they cut the vein, Gashwiler, of San Francisco, now dead, became interested with them in the claim, and work was continued a few months, when a dispute arose as to the ownership of the ground, and work was suspended. In 1882 Grisby & Johnson commenced work on the claim, where the Bounsalls had drifted from the vein, and continued northward on the vein, finishing when a point 350 feet from the end of the tunnel had been reached. At the north end of this drift another shaft was sunk a distance of 65 feet. In 1877 Mr. Johnson commenced sinking a shaft a short distance to the north of the entrance to the Bounsall tunnel, and on the Old Discovery claim. Work was done in it at different times until resumed in earnest several months ago, when it was sunk through very hard rock to the depth of 168 feet. Through this (the working) shaft, all ore and rock is now raised, a whim being used for the purpose. From the bottom of this shaft a cross-cut 180 feet long was run through extremely hard rock toward the west. The crosscut reached the Old Discovery vein in 45 feet, and the Easley vein was cut 135 feet further on. This crosscut opened up the third level of the mine. Drifting on the Easley vein from the end of the crosscut was continued south 70 feet, when a 65 feet upraise was made to the bottom of the Bounsall winze, making the winze now more than 120 feet deep. Work is now being pushed southward in the vein on the third level, and northward from the point where cut by the crosscut. This drift is now 135 feet long, ore being found the entire length, some of it very low grade and the balance good milling and high grade. The same has been found true in the first and second levels. A great deal of drifting, etc., has been done on this property which is not mentioned here, as it is in another part of the mine, and for the present has very little to do with the work now being done, though all will be of consequence hereafter. Up to this time nearly 1100 feet of drifting and crosscutting has been done under ground on this property, and also 360 feet of shaft; and an immense amount more in contemplation. All work done by the present owners is entirely satisfactory to them, and the further the ore veins are opened up the better the owners are pleased. Aside from the thousands of dollars expended on this property by others, Grisby & Johnson have alone paid out over $23,000. Six hundred tons of high grade ore have been raised to the surface, and very many tons of low grade, all of which will be worked when a mill is erected—probably within a few months. The best ore taken from the drifts during the coming few weeks, will be sent to the new reduction works at Vallejo Junction, to be worked soon as things there are in readiness.

Nevada.

ENCOURAGING REPORT.—*Herald*, Feb. 21: A gentleman of this city has received a letter from a party in San Francisco, in reply to an inquiry regarding the feeling in that city concerning the quartz mines of California and particularly of this county. The writer is in a position where he is daily brought in contact with mining men. He says considerable interest is at present manifested in the quartz mines of this section, and gives it as his opinion that little trouble would be experienced in getting capitalists to take hold of mining property, provided it is in such a shape as to warrant an investment.

MOUNTAINEER.—The Mountaineer mine, situated on the right bank of Deer creek, a short distance below town, continues to produce an abundance of fine gold-bearing quartz. The rock now being taken out carries a large percentage of rich sulphurets, besides some free gold. Fifteen stamps are kept running steadily night and day, and the returns, we understand, are highly satisfactory. The mine is worked by tunnel and the machinery driven by water power. Among miners the Mountaineer is regarded as one of the best locations in the district, both for richness and indications of permanency. At the Nevada City mine, in Woods Ravine, the full complement of 20 stamps are pounding away upon high-grade ore, and eight Frue concentrators are required to catch the sulphurets. This mine is a big gold producer, and although noted for its rich pockets and bunches of specimen quartz, the general quality of the ore is far above average. The company have very complete and well-arranged works. A hurdy-gurdy water wheel runs the machinery. The quartz is fed into the batteries by patent ore feeders, the invention of Geo. A. Church, who is foreman of the mill. The feeder consists of an iron receptacle, which somewhat resembles a barrel cut in two lengthwise, and in which a large auger-shaped piece of iron slowly revolves amongst the rock that falls in from above. As this huge auger, as we will term it, turns around, a certain quantity of rock is discharged into the batteries at regular intervals, there being a break in the thread of the auger so as to prevent constant feeding. The feeder never clogs and will work equally well on all kinds of rock, either hard or soft. The Wyoming keeps up its regular yield and look as well as ever. The mill is running steadily on good rock; and a full force of miners are employed in extracting the ore. The Wyoming is one of the best paying mines hereabouts, and is systematically and economically worked. At the Merrifield mine the mill has not been running for a week or so, owing to a scarcity of rock on the dump. The miners are kept prospecting and new developments are daily expected. The Providence is the old reliable of all the mines in the district and there is but little difference in the monthly outputs. One of the finest and neatest quartz mills in the State is owned by this company. The 40 stamps and 16 Frue concentrators are kept running all the time, there being no trouble in getting plenty of rock. We understand the Charonnat mine, at Canada Hill, is looking well. Splendid rock is being taken out from the lower level. This mine has given handsome returns during the past few years, and we hope it will continue to for many years yet.

BIG PUMP STARTED.—*Tidings*, Feb. 21: The large Lawrence pump, at the North Star, was started last evening, and everything worked to a charm. The pump is throwing a volume of water, and in a short time the company will be able to see the bottom level.

Shasta.

SOUTH FORK-IGO ITEMS.—Cor. Shasta *Courier*, Feb. 21: Messrs. Jutton and Shaffer have put the battery of the Chicago mill in good order and placed a new pattern Frue Vanner in position. They started up the past week and everything is now running well. Could the freight on concentrations be saved, there would be large quantities of low-grade ore worked which we cannot now profitably. Work on the lower tunnel of the South Chicago is being continued, with the expectation of soon reaching the ore chimney had in the tunnel above. Shirland and Henneken are at work in their lower tunnel on the Continental and are getting some ore, although the ledge is still much broken. Messrs. Meek, Hubbard and H. Abbott have just finished a satisfactory run for their Pacific mine. Prospecting and relocation of mines is now the order of the day.

Sierra.

BALD MOUNTAIN.—*Mountain-Messenger*, Feb. 21: The Bald Mountain Co., at Forest City, are employing 56 men. Near 100 ounces of gold was cleaned up from ten carloads of gravel from the incline under the lava flow this week. It costs $4 per carload to bring it out. An ounce and a half nugget was picked up in one of the Extension breasts this week. The Rainbow Co. are still searching for the extension of their ledge. We heard a few days since that the Marguerite pumps were almost ready to begin the work of clearing the lower levels of water. The wire rope power is a complete success. Geo. Parent came up from Pike City, Thursday, and says the Alaska Co. is taking out rich quartz. Jerome York has taken charge of the works in Slug canyon. The work of getting down rock is progressing favorably. The mill is now running night and day. The little rock taken out has been very rich. It is thought that no further difficulty will be experienced in getting all the quartz the mill can crush.

Siskiyou.

PICK AND PAN.—Yreka *Union*, Feb. 21: The weather at present looks rather unfavorable for an early season for the river miners. Johnston's 10-stamp mill at Oro Fino is still idle, but will probably be set in motion next month. Messrs. A. G. McCoy, J. M. Gleaves, Peter Johnson and John Spelman have recorded a quartz ledge in the Salmon district. John Pitz has deeded to H. J. Diggles of Fort Jones one-half interest in a quartz ledge situated in Quartz Valley known as the Big Ledge. M. Slater and Luke Shaw has just recorded the location of 40 acres of placer ground in Quartz Valley. The claim will be known as the Shackelford. Amos F. Jacobson has located 20 acres of placer ground, to be known as the Red Bank mine, in the south fork of Salmon mining district, near Petersburg. Tucker & Co., below the mouth of the east fork of Deadwood, will soon clean up. They have crushed upward of a hundred tons of ore, and expect good returns. Martin Olsen has located on the north fork of Salmon river, Liberty mining district, about 9 miles below Sawyer's Bar, 20 acres of placer ground, to be known as the Swan claim. Mr. Wm. McConnell, owner of one of the most extensive river claims on the Klamath, is anxiously awaiting low water. Last season Mr. McConnell took out upwards of $29,000. R. H. Campbell and a number of gentlemen from Red Bluff have taken up a placer claim to be styled the Cyclone, near the trail from Summerville to Cecilville. The tract comprises 160 acres. Campbell, in his mine in Quartz valley, has been piping since New Year's with a force of 12 men. Every indication points to a more profitable season than last, when the cleanup amounted to over $40,000. Wright & Fletcher at Oro Fino are running their giants, full time, with a large force of laborers. Their claim is recognized as one of the best and most extensive in the county, and it has never failed to yield large returns. John S. Lowden and Geo. W. Lowden have purchased the John Madden claim, situated 2 miles below Humbug on the left bank of the Klamath river, together with the ditches and water rights. The claim comprises 27 acres. George C. Spooner, Mr. W. Spooner, A. W. Morris, Jno. Parker, Alex. Parker, Jr., and Louis Davis have located 160 acres of placer mining ground in the south fork of Salmon district. The claim is to be known as the Capitol. Messrs. J. M. Single, Fred Smith, A. M. Johnson, J. W. McBride, Dr. C. W. Nutting, Charles Kist and C. H. French, all of Etna, have taken up 160 acres of placer ground in south fork of Salmon district to be known as the Blaine mine. J. S. Cameron, A. J. Loomis, T. R. Ryan, W. B. Calhoon, George Taylor, D. W. Frank, H. C. Hughes and George Smith have located a claim of 160 acres near the trail leading from Petersburg to Cecilville, to be known as the Diamond. Active operations have commenced in the hydraulic claim of Smith, Campbell & Spooner at Summerville, and the owners look forward to a profitable cleanup. The 4-mile ditch, which is to tap the Little North Fork of Salmon, is being rapidly constructed. Lieutenant-Governor Daggart and family will take up their residence at Black Bear immediately after the Legislature adjourns. Work on the mine will then commence, with a large force. We believe it is the intention of the Governor to give work to a number of men who have families, which will make quite a settlement at Black Bear. The first of March, A. M. Johnson will start 8 or 10 men at work on the Johnson ledge at Oro Fino, which has yielded a handsome fortune for its owner since its discovery. Mr. Johnson has had 2 miners prospecting the ledge all winter, and in working the lead this season will follow a course planned from observations made by the prospectors. The rock yields $40 to the ton. Carroll Brothers, in Quartz valley, are taking ore from their mine, and are much encouraged with the development made thus far. Their tunnel extends 300 ft, and the vein is confined within well-defined walls. The rock crushed last season averaged $33 to the ton. They now have about 20 tons in the dump and 4 men are engaged in mining. They have 3 arastras which will be started as soon as the weather moderates.

Yuba.

OLD LEDGE.—North San Juan *Times*, Feb. 21: John Clay, of Garden City, Yuba county, made us a call on Monday last. He reports having found a quartz ledge at Dad's gulch, in the neighborhood of the Slate Range House, which prospects well. It is an old ledge, worked 20 years ago, which then paid immensely, but for want of machinery was abandoned by its owners.

NEVADA.

Washoe District.

GOULD AND CURRY.—Explorations are being made from the new station on the 1000 level of the Bonner shaft in ground never before prospected.

OPHIR.—They are working the north lateral drift on the 500 level and will continue through the Mexican and Union ground.

YELLOW JACKET.—They are still working on the old upper levels and extracting a large quantity of low-grade ore.

CROWN POINT.—The usual amount of low-grade ore is being taken out and shipped to the mills.

CHOLLAR.—On the 3000 level they are beginning to drift south and are in good ground.

SAVAGE.—On the upper tunnel they are cutting good quartz.

HALE AND NORCROSS.—*Enterprise*, Feb. 21: The west crosscut on the 2900 level is out 40 ft in good looking quartz. Crosscut No. 2 has not yet struck the vein, but finds feeders assaying $14.

Central District.

AT WORK.—*Silver State*, Feb. 21: S. W. Hammand, of Central district, is in town. He says everybody is at work down that way. The Locomotive mine, which was leased by Frank Clark to Gould & O'Donnel of Mill City is looking better than ever before. The mine has been systematically opened, and the lessees have commenced stoping. They have hauled 100 tons of ore to the mill, and the mine is now in condition to furnish all the ore the mill can reduce.

Columbus District.

MOUNT DIABLO.—*True Fissure*, Feb. 21: The west drift on the sixth level is now in 137 ft, and the south crosscut from this drift is in 27 ft. The raise from the west drift on the fifth level has been stopped and a drift started from the raise to correct with the west intermediate from winze No. 1. There remain 6 ft to drive, and when the connection is made a stope will be started, and should yield a good deal of high-grade ore as the outlook is very favorable. The stope near winze No. 1 on the fifth level, shows some $45 ore. The west drift on the fourth level has connected with winze No. 7, and work has been started on a little $80 ore found in this drift. The winze from the intermediate between the third and fourth levels and east of shaft, has connected with the fourth level and a stope has been started on a little $100 ore. The stope west of the shaft, between the second and third levels and west of the shaft, is turning out a good quantity of from $30 to $60 ore from a ledge 2 ft in width. The east drift on the second level is giving some $100 ore from a small ledge. The remaining parts of the mine are looking well and yielding considerable ore. A bullion shipment amounting to $6,824.76 was made on the 15th instant.

Cortez District.

THE GARRISON MINE.—Eureka *Sentinel*, Feb. 22: One of the most valuable mining properties in Cortez district, and a property that is scarcely ever heard of by the outside world, is the Garrison mine, 10 miles south of Bullion Hill. It is owned by S. Wenban, and the ore being extracted from it keeps a 10-stamp mill, owned by the same gentleman, in constant operation. Sometimes when the ore extracted is unusually rich good sized shipments of it are made to Salt Lake City for reduction. Some 70 men are employed in the mine and mill, and the shipments of bullion will exceed a monthly average of $40,000.

Eureka District.

THE EUREKA CON.—*Sentinel*, Feb. 21: The improvements going on at the Eureka Con. works have assumed tangible form, and the work of mixing ores is now in active progress. The mixing floor, which is 10x22 ft, has already on it mixed ores to the depth of 15 inches, and enough ore and flux is in a large adjoining room to make in all at least 120 tons. When this plant is complete several trapdoors in the floor will be opened and the mixture will be allowed to drop into a large bin the entire length of the structure. When the furnace is completed and ready to receive ore for smelting, self-dumping cars will be filled from doors in the bottom of the bin, and they will then be drawn up over a cable tramway to the floor of the furnace building. The mixing floor is sufficiently capacious to accomodate at least 500 tons of ore. Every thing about the works will be so arranged that no shoveling of ore will be required from the time it is mixed until it is fed to the furnace, and it is the opinion of Superintendent Robbins that the company will be able to handle ores much cheaper than has ever been known in this section when all their improvements are completed. We might add that all the present improvements now being made are such that they can be added to as the requirements of the company may in time demand.

Reese River District.

THE MANHATTAN COMPANY.—Austin *Reveille*, Feb. 18: The Manhattan Company is putting up machinery on the old Union shaft just above the Naiad Queen works. There is a shaft 200 ft deep there which has been idle for some years. This will be cleaned out and repaired and sunk deeper. Powerful machinery is to be erected upon these works and the business of prospecting this new country will be energetically pushed. Ever since the famous Whitlach ledge was lost that particular section has been looked upon with much interest and now the company will prospect for it or any other ledge which may be shown up. They are now busy erecting the machinery and building over the Union, and already the frame work can be seen looming up just to the left and a little above the old concentrator.

Safford District.

QUIET.—Cor. Eureka *Sentinel*, Feb. 20: The mining news in this quarter is rather meager. No work is being done, except at the San Francisco tunnel, which is being run on a contract by the Shields Brothers. I am taking out and shipping ore to Salt Lake from the Onondago. I am making an effort to place the mine again on velvet, which, with careful, economical management, I hope to accomplish within the next 90 days. Am doing no dead work on the mine at present.

Tuscarora District.

INDEPENDENCE.—*Times-Review*, Feb. 21: East crosscut, 400-ft level, has been extended 19 ft, total length, 43 ft. South drift, same level, advanced 19 ft; total length, 1,048 ft.

NORTH BELLE ISLE.—North drift, 150-ft level, has been extended 55 ft., Progress for the past week, 18 ft.

BELLE ISLE.—During the past week the drift north on the 70-ft level has been connected with the upraise from the 150-ft level. Work will be resumed at other points in the mine during the coming week.

NAVAJO.—The 650-ft level has been drained, and the station pump is being set. Work will be resumed on this level in a day or two. No. 1 winze on the east lateral vein, 350 ft level, has been sunk 24 ft. The bottom of the winze shows its full width in vein matter, carrying some low grade ore.

Union District.

IMPROVING.—Cor. Eureka *Sentinel*, Feb. 21: In Union district it is expected the first of May, if the season is propitious, will witness the commencement

of a mining boom, which, once started, must necessarily be a success. If the best indications do not fail the owners of mining property will have a furnace erected in their district, or commenced by that time. All signs have been known to fail, especially in mining matters, and as a hucolic maiden once remarked: "It is not safe to count your chickens before they are hatched." This observation may not be amiss in this case, but as some valuable mining properties were bargained for and sold, conditionally, with a stipulation that a furnace should be erected, it seems safe to assume that something will be done there this spring. At present but few men are working either here or in Union. On the Hill the Silver Reef mine is turning on some very fine ore, but in small quantities. From the Swallow also, some ore of a fair grade is being extracted. The output of the latter mine will probably be shipped to the Palisade furnace after that institution discharges its financial obligations, which, no doubt, will be done within the next few months, or, as interested parties say, "by the first of June or before." Several locations of considerable promise have been made in Uninn recently in anticipation of a furnace in the near future. The snow is very deep in portions of the district, and but little progress can be made in developing new properties until spring opens when it is to be hoped, the most sanguine expectations of the owners will be fully realized.

ARIZONA.

LUCK SURE.—Tombstone *Epitaph*, Feb. 20: Chloriders have been at work on the lower level of the lower ledge of this mine for some time, and have within the last few days opened out a showing of superior grade of hard carbonate with formation crevices from ledge indicative of opening into a chimney. Now on dump about eight tons of high-grade ore. To connect the upper ledge with the 300 level of the lower will require a cross-cut of about 150 feet, a contract for driving which will probably be let in the near future.

T. M. & M. CO.—Smelter and both mills at Millville, under the management of mill Supt. Cheney, are running constantly on ore from West Side and Stonewall principally. There has been a rumor for several days that in the lower workings of the West Side and from the ledge a large chamber of high-grade ore has been opened. In the absence of Supt. Cheney we declined to press the question. At the reduction works of this company about 95 men are now employed.

OLD GUARD.—The new shaft is now down 42 feet with north drift in 38 feet and south drift 30 feet. South drift face shows two feet of fine pay ore while the north has a pay streak width of five feet that will average 50 ounces. Four and a half tons of $200 and upwards of six tons of $100 ore are sacked for another shipment to Socorro, and on the dump there is 150 tons of 30 ounce and 40 tons of 30 ounce rock.

HEAD CENTER.—Thirty-two tons a day is the shipment to the mill, which therefrom is shipping bullion at the rate of $1,000 per day. The main shaft is down 200 feet, with drifting on ore progressing on the 100 and 200-foot, on which latter there is now upwards of 500 feet of work. Fifty-six men are employed by Supt. Batterman in the mine and 16 at the mill.

MAMIE.—Capt. Taylor evidently intends business on this property under his lease, from the preparation now making to put the mine in proper shape for work, which will require a fortnight yet, as the property was left in a very bad condition for economic handling. Though nothing is being attempted as yet except preparatory work, yet ore was coming to the surface yesterday.

CONTENTION.—Supt. White is expected to arrive shortly, but, though merely conjecture, it is not likely that much will be done prior to the completion of the Grand Central pumps. The 47 feet of 24 ounce average ore below the 600 level will not spoil by waiting, and the mill is running constantly on the immense tailings dump that has accumulated there.

JUNIETTA.—Superintendent being absent from mine, and foreman close-mouthed, no information gleaned, further than could be seen on the surface. Some eight or ten men are, we believe, employed in the mine, and on the dump yesterday there was over 200 sacks, representing about 15 tons, of a very superior grade of ore awaiting shipment by rail for reduction.

EMERALD.—Shipments to the mill are at the rate of 800 tons a month and have been for some time past. The two shafts, 250 feet apart, are connected on the ledge both on the 150 and 250-foot levels, while the north drift is down 350 feet and sinking progressing. The north and south drifts on the 350 level having a combined length of 250 feet.

GRAND CENTRAL.—From foreman Leach it is learned that the pumps will be ready to commence sinking about the first of June. All the ore shipped now to the mills is taken from above the 500-foot level and mostly from the 400 level and above.

STONEWALL.—A daily shipment is made to the T. M. & M. Millville smelter of manganese ore. Winzes are now down from the 340-foot level 70 feet in pay ore. About a dozen men are employed in the mine.

BONANZA KING.—East of Ajax hill and probably on Emerald lead, shaft now down nearly 60 feet and ast shot yesterday indicates near approach of ore. Walls from within 20 feet of surface.

CONTACT.—Whim just finished and will start this morning over new shaft 50 leet deep and about 300 feet from the old main shaft or ledge, showing a good healthy prospect.

STATE OF MAINE.—Working is now down over 500 feet, work going on under lease with continued output of limited quantity of exceedingly high-grade ore.

LUCKY TIMES EXPECTED.—Prescott *Courier*, Feb. 21: The *Courier*, in looking to the mountains, sees that snow is going and that the season for active work in the mines will soon be here. Signs are that it will be an active, prosperous season, too, which is just what our people want. Our reasons for expecting lively times are as follows: In the first place our miners own good properties, such as the chloride deposits of Humbug district; the rich veins of Bradshaw, Peck, Turkey creek, Big Bug, Hassayampa, Walker, Santa Maria and other districts, the fine copper properties of the United Verde company, and others. The Howell reduction works will undoubtedly be run. Mr. Chase is running one mill; the Conger mill is at work; the Humbug district mill, now idle, will soon be started up; the United Verde company's smelters will soon be fired up, and there are many other plants to be heard from. In addition, the shipment of ores will be continued, so there is not, in our opinion, cause for anything but rejoicing on the part of people who, of late, have been in a despondent mood.

CHERRY CREEK.—Cor. Prescott *Courier*, Feb. 21: This camp is the only one that has worked its mines continuously since they were taken hold of, and too much praise cannot be given the company who have worked their mine and constructed the most fully equipped and complete gold mill in northern Arizona. This mill is run by water power. I am speaking of the Conger Mill and Mining Company. The ditch is two miles long and six feet wide, and some of the cuts are 12 to 18 feet deep. The mill is a 10-stamp gold mill, from the firm of Frazier and Chalmer, of Chicago, and was built under the direction of Mr. Ed. Morey. They have two Frue-Vanning concentrators and intend to put two more in place. It takes but two men to run the mill. It is run by an 80-horse power turbine wheel and they can mill ore so much cheaper than any other mill in Arizona, as a great deal of expense has been done away with. Mr. Ed. Morey has charge of the mill and is assisted by Fred Bush, a son of the general superintendent and manager. They have 14 men at work on the company's property and six men around the mill. I found ont that the mill saves all that is in the ore and I prophesy that they will reap a fortune by having pluck and energy to further prosecute this work after so many disastrous failures on the part of the former management.

NEW DISTRICT.—Yuma *Sentinel*, Feb. 21: D. M. Field, of Tacna Station, came into town last Sunday. He reports the organization of a new mining district in Cabeza Prieta Range, near Tule Wells. The district is six miles square and is known as the Cabeza Prieta Mining district. The celebrated gold mine known as the "Chloride," recently taken up by D. M. Field and George Hurley, is located about the center of the district, and is said to be the richest strike ever made in this country anywhere. This location was an old prospect discovered about 15 years ago by a Mexican, and an assay of the ore then made gave a return of $900 to the ton in gold. J. M. Redondo, who intended to go on with the mine and work it for a certain share with the discoverer, died soon after completing arrangements. The discoverer, who having become discouraged at the death of Redondo, took sick, and he too, soon died. All this happened some 15 years ago and during all this period of time the mine has been idle, as no one knew of its exact locality. Several persons had been looking for it for weeks and months but without success. Finally the wheel of fortune turned in favor of D. M. Field and George Hurley who became the lucky finders and who feel very much elated over their splendid luck. They say they have the biggest and best mine in the United States, or perhaps, the world. This great bonanza is about 75 miles southeasterly from the Tule Wells, in this county. It is about 35 miles from Tacna, the railroad station. The ledge is 40 feet wide, and the very surface rock assays $90 to the ton. The ore is of a peculiar texture and can be worked with ordinary picks and shovels, and without blasting.

PLACER MINING.—Arizona *Silver Belt*, Feb 21: On Wednesday we visited the placer digging, on Pinal creek, near the Anderson ranch, and were surprised to find that Messrs. Chaffin and Phillips, owners of the claims, had completed their ditch, and had begun sluicing. Taking out a ditch 6,000 ft long is no small task, and the last 150 ft necessitated a 6-foot cut through a cement formation, which was very difficult to work, and required some blasting. They have a good flow of water through their sluice box, probably 40 inches. The box is 86 ft in length, 14 of which is flume. Two kinds of riffles are used—the Flat, which consists of a flat board perforated with half-inch holes, into which the gold is precipitated, and the Hungarian riffle, which consists of cross pieces several inches in depth, which are placed parallel to each other in the bottom of the box, like the rungs of a ladder. Work was commenced at the mouth of the gulch where the ground had previously been partially worked over, so that great results are not expected for a week or more. However, the dirt samples fairly, some showing 10 to 15 colors to the pan. In company with Mr. Chaffin we went up the gulch half a mile, and saw several pans of dirt taken from different places, washed out; one contained 9 colors, another 12, and still another 27. The gold is comparatively coarse, the largest pieces we saw being about the size of a pin head. They hope to have a sufficient head of water for two months yet.

COLORADO.

CLEAR CREEK MINES.—Colorado *Miner*, Feb. 12: The Ætna lode, situated on Griffith mountain, has joined the ranks of our prominent producers. Five different parties of lessees are working claims, and all are in good mineral. In the breast of the east drift of the Victoria tunnel level, on the Mendota lode, the lessees have exposed a vein of solid ore about two and one-half feet in thickness. Wm. Shavallin & Co., lessees on the third level of the Bismarck lode, have at this writing a vein of solid ore, about four inches in width, of a very good grade.

IDAHO.

TUNNEL.—Idaho *Avalanche*, Feb. 21: We understand that a prominent mining man, who has followed that occupation for a number of years is going to organize a company to run a tunnel into, and possibly through Florida mountain. The place of beginning will be above Lincoln mill. The tunnel will come out on the other side of Jacobs' gulch. The scheme is a good one if it could be put through. There are many ledges in Florida mountain that have never shown any croppings, while there are others of good size that have been quite rich on the surface. The formation is good working ground, and rapid progress could be made. The tunnel will strike the ledges about 1,400 feet deep, and will afford an excellent drainage for the numerous ledges that it will be sure to cut. Before the tunnel reaches half way to Jacobs' gulch, it will have cut ledges enough to pay all the expenses of running the tunnel. Let the good work be prosecuted, and old Florida, with gold from its base to its summit, will show up the best mining property in the Territory.

ELLENSBURG.—Cœur d'Alene *Sun*, Feb. 18: A town has been laid out on East Eagle creek, at the mouth of Cypress gulch, called Ellensburg, after the Christian name of a daughter of one of the locators. The town is 11 miles from Eagle City. The names of those interested in the townsite are James Myers, Josh Collins, James Taylor, J. Huey, R. Dunlay, John Connelly, Joseph Skillington and Thomas Skiffington. The town is laid out on a sunny bar up and down Eagle creek, with eight blocks, divided into lots of 50 feet front on Main street by 150 feet in depth. The placer mines are situated in the immediate vicinity and Tributary gulch comes into Eagle creek a mile below town. The locators of the place believe the outlook of the diggings justifies the building of a town, as the entire region for a circuit of several miles prospects well.

MONTANA.

LITTLE PIPESTONE.—Cor. Butte *Miner*, Feb. 21: The district is situated about 18 miles from Butte City on the Little Pipestone, and is one of Montana's garden spots. No high inaccessible rocky ranges, but accessible at all times, winter or summer, to all parts of the district, which makes it more favorable for the pioneer prospector. I have visited the Princess lode, owned by McBride, Covert & Co. The shaft is the deepest, so far, in the district—212 feet on the incline, with a fine body of ore in sight all the way down. Levels have been run 50 feet each way from the shaft at 100 feet. They show fine bodies of ore of a high grade, gold and silver. The assays run as high as $350 in gold and 250 ounces in silver. There are 200 tons of ore in the dump, aside from what has been milled. Since my visit, I am informed, the company have made a sale of the property. I visited other properties owned by this company, in the immediate vicinity, and found them all looking well. Shafts sunk from 10 to 40 feet deep on a vein from two to four feet between walls, with fine bodies of quartz, bearing mineral which assays from 50 to 800 ounces. East of the Princess I found our friend, Blodgett, sorting ore. He is working four men, down about 40 feet, has a fine chute of ore, and a new shaft and whim house 24x40 feet. Everything about this mine indicates prosperity, and shows that the owner is there to stay.

About three-quarters of a mile west, on Reeder creek, lays the Honiker mine. The shaft is down 80 feet, and three men are working with whim. The ledge matter is mixed with a little quartz all the way. The owners are sinking a shaft 100 feet, and will cross-cut for the walls. South of this location, about three-fourths of a mile, is the Ajax lode, owned by Burton, Wallace & Co. They have been working a crew of men all the fall and winter prospecting their property. They have sunk a perpendicular shaft 85 feet and not tapping the lead, run a cross cut west 20 feet before finding the foot wall. They found the ledge 7 feet wide between walls with 3 feet solid quartz, which sampled 260 ounces. This company have shipped a number of tons of milling ore. They intend to put up the necessary buildings and machinery, put on a force of men and crowd development. South, on this lode is an extension owned by W. P. Emery and W. C. Lee, called the Continental. The shaft is about 30 feet deep on the incline with 6½ feet of ore between walls. The breast shows a fine ore body. South, and east one-half mile is the "Don't Care" mountain. Emery & Lee have a fine lode called the "Don't Care." They have commenced running a tunnel and are in 80 feet, and are taking out some ore all the while, but do not expect to strike the main ore chute found at the discovery shaft under 75 feet further.

The Alta mine No. 1, owned by Standard, Wallace & Co., is as fine a mine as any one would wish to look at, and is situated on the banks of the Little Pipestone. The workmen are 120 feet deep on the incline, at the water level, where they have stopped sinking. They have 2 feet and 9 inches of ore, which samples 320 ounces and a large amount of pay rock in sight. I was told the company refused $30,000 in cash for their mine last summer. The Christian lode, owned by D. Morrison & Co., has 2 men at work. A whim and shaft house are up and the shaft is 85 feet deep; water level has been reached. Arctic Lode, owned by Pankey, Lee & Co., is on the north branch of the Little Pipestone; two men are at work cross-cutting the vein to find the walls. They have run south 26 feet in ledge matter from bottom of shaft, without finding them. The Chiselway lode, Clark & Co., is a gold lead, free milling. Lowest sample assay from the dump $25 in gold; the highest sample assay from the dump, $85 in gold, nine ounces in silver. This shaft is 50 feet deep, with fine walls and every indication of permanency on the surface. They have about 20 or 25 tons of pay rock on the dump and all from the shaft. A contract has been let to sink a shaft 50 feet deep and run levels each way from the bottom. The major portion of the work mentioned above was done the past fall and present winter. A little prospecting was done a year ago.

NEW MEXICO.

IDLE MILL.—Lake Valley *Herald*, Feb. 20: The mill remains idle, awaiting the discovery of some plan whereby a sufficient quantity of the ore can be saved to pay for milling. So far experiments have resulted in saving only about 50 per cent. The question of turning it into a smelter has been discussed, in view of the fact that no satisfactory arrangement can be made whereby they can control the Billing smelter at Socorro. The president and board of directors are expected out in the near future, and some definite action will be taken.

BONITA BULLION.—Cor. Rio Grande *Republican*, Feb. 21: Herman Beck has gone East to again try his luck with the tight-fisted money holders, and says he will not come back without machinery for the reduction of Bonita ores. Work still goes on in the Christmas tunnel, with a good prospect of soon unearthing a fine body of high grade ore. The ore looks well at present, and presents a flattering and encouraging future for the owners. The contract on the new shaft of the Chinaman is completed. The shaft is now 50 feet in depth, and exposes argentiferous galena from two and a half to three and a half feet wide the entire depth. The company will resume work on the tunnel, and push it till the lead is cut. Parsons and Halsted are working the old Bill Nye claim, now known as the Silver Queen; they will put the shaft to a depth of 100 ft. The assessment was done by starting a tunnel in the gulch east of the old shaft on the lead, and exposed a streak two feet wide of argentiferous galena ore, with small streaks coming in. O. P. Burt and M. Calhoun, of the firm of Burt, Reynolds & Co., are here, pushing the work on the Rosa mine. The water wheel is ready to put up; the creek is dammed, the ditch is completed, and a rick of ore of 100 tons is nearly ready to set on fire to roast for smelting. Mr. Goodwin arrived to-day, and will proceed at once to erect a blast furnace. Most of the material for the completion of the work is in White Oaks, and will be here this week. The mine improves with every blast, and is fully 10 ft wide at the head of the 90-foot tunnel, and the entire gangue is well impregnated with the precious metals. The management propose to start a new tunnel 35 to 40 ft below the present, and they will put one shift on it this week.

OREGON.

PLACER AND QUARTZ.—Jacksonville *Times*, Feb. 21: Considerable prospecting is going on in southern Oregon at present. There was some rain this week, but not enough to do the miners much good. Considerable mining is being done on Rich gulch, Jackson creek and Farmer's flat. Many of the miners are at work and considerable gold dust will be taken out this season. Dean Bros. of Willow Springs precinct are doing considerable work in their placer diggings at Willow Springs precinct. S. Dysert of Leland precinct is taking big pay out of his placer diggings. Other miners in that district are also doing well. J. Roten of Willow Springs precinct showed us some fine specimens of quartz, which he had taken out of his mine last week. B. F. Pierce, C. C. Ragsdale and others have located a quartz ledge in the vicinity of Gold Hill, which promises finely. Some excellent rock has already been secured and work will be vigorously prosecuted before long. Geo. H. Chick of Portland is now in San Francisco to buy machinery for his company's reduction works at the Metropolis. When he returns he will in all probability visit the Schumpf and other ledges in this section. S. Bailey and F. Cimborsky, who took the contract for digging a shaft 50 feet deep on the Enterprise Co.'s mine in this place, gave up the job after going down 10 feet, as they found the rock to hard to make their contract profitable. The work will nevertheless be continued.

UTAH.

REVIEW.—Salt Lake *Tribune*, Feb. 20: The week has been one of storm and casuality, the chief of which, and the worst that has occurred in many years, being the great disaster at Alta, that occurred on Friday evening last, in which 28 persons were engulfed and 13 killed. The shipments of bullion and ore from this city for the week ending February 14th, inclusive, were as follows: Twenty-two cars ore 611,286 pounds; nineteen cars bullion 433,629 pounds Total, forty-one cars, 1,044,915 pounds. The receipts of the metals for the week have been very light. Daily reports give these figures in aggregate to the 18th, inclusive: Bullion, $49,503.50; ore, $15,193.79; total, $64,697.29. For the week previous the receipts were $75,799.55 of bullion and $12,143.92 of ore. There are no exports from the Horn Silver, and nothing doing at the mine in the way of getting out ore since the cave heretofore reported. Preparations are making to get in from the new shaft, as it is probable no further work can be done in the old opening. The Ontario shipped 20 bars of bullion during the week, assaying $14,743. Total of the year to date, $212,608.87. The Christy, of Silver Reef, sent up 3 bars of silver during the week, $4,700, and the Stormont 2 bars, $3,352, a total of $8,052 from the silver sandstones. The product of the Germania smelter for the week was 10 cars of bullion, $20,428.50. Utah ores were received as follows: From the Crescent, to the value of $7,500; from Eureka, $2,800; a total of $10,300.

HORN SILVER.—Southern Utah *Times*, Feb. 21: The discharge of over one hundred men from the Horn Silver mine, is having a most depressing effect upon the business of the camp. In fact, the merchants feel as though it were the straw that will everlastingly break the business back of Frisco. In our opinion the break is a serious one—that is, it will be many months before the present Horn Silver management will have on its pay roll as many names as incumbered it on the tenth of this month. Those who have held on so long, hoping against hope, are justified in feeling that though unsatisfactory as has been the past, it was as sunlight compared to the darkness with which the immediate future is enveloped. The mine is in such a condition since the recent cave, that not to exceed a score of men can be employed to advantage for some time to come. As a man of large mining experience said the other day, "Work on the Horn Silver mine, in the near future, will amount to no more than the opening up of a prospect." This is the situation that presents itself to the inhabitants of Frisco, in this, the second month of the year 1885. The present unfavorable state of affairs, is, as we have indicated, largely attributable to the condition of this mine. It is possible that the Horn will eventually bear an output of ore commensurate with the past, both in quantity and quality, for an indefinite period. The trouble is, that the recent caves and continued settling and working of the ground have rendered the taking out of ore impracticable, if not impossible, for a long time. But time works many changes for weal or woe. Let us hope, at least, that ere many months, the Horn Silver will again be in full blast and working a full complement of men. Of other mining enterprises in this vicinity we are glad to be able to speak more hopefully. The time is near when the hum of active mining will be heard in Copper Gulch. The Comet Company has been industriously, and, we are happy to state, successfully engaged in perfecting arrangements at their headquarters in Paris, whereby ample capital has been raised with which to open up their property. The uncovering of a paying mine at Copper Gulch, would give an impetus to the mining industry of this district not yet dreamed of. And if reports of experts and experienced miners are in anyway reliable, there is little doubt but that the Comet, by intelligent development, will soon prove a veritable bonanza. The Rattler mine, in the Carbonate Camp, continues and is likely to continue to employ its full complement of men, as Superintendent Davis is highly elated over recent developments. The outlook for Star District is being materially brightened by the construction of reduction works at Milford. Very favorable reports also come in from the other neighboring districts, so the future may not be as black as it is painted.

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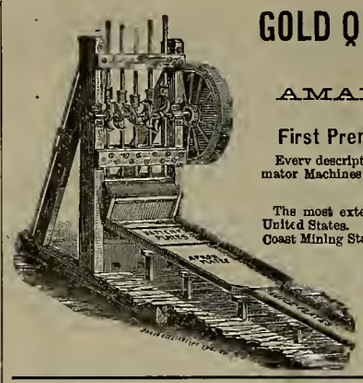

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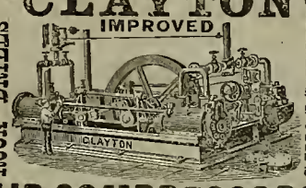

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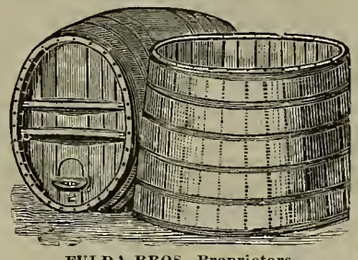

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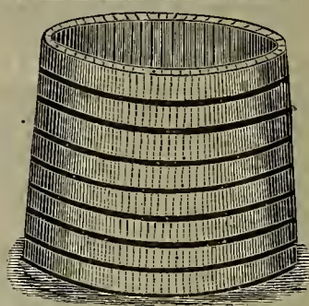

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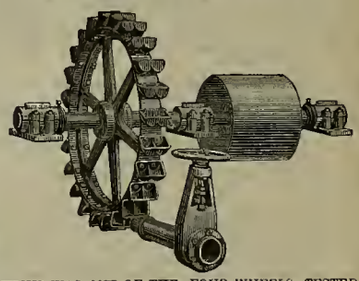

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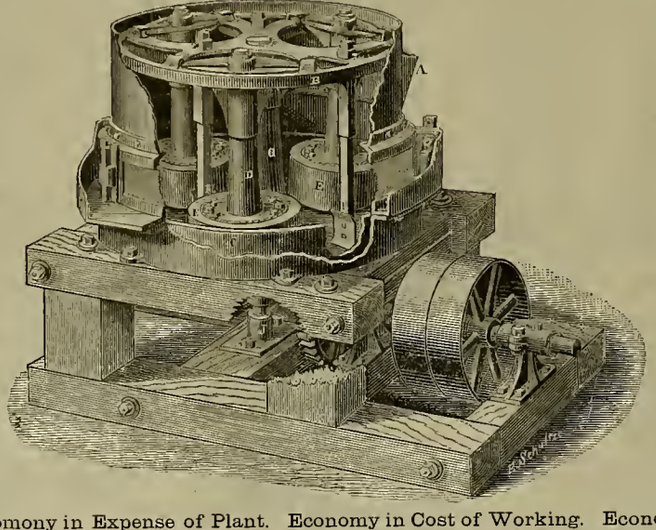

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Practical Instruction given in Treating Ores by proved processes.
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Readers will please inform their new neighbors and others concerning our paper and these offerings. On application, sample copies of this paper will be mailed free to the address of any persons thought likely to subscribe.

Mining Share Market.

While the stock market has remained steady there has been no special interest manifested outside that ceatering in Hale & Norcross. It is thought there is a prospect of striking something on the 2900 level of this mine. At the office of the Hale & Norcross the reports of the officials are of favorable character. West crosscut No. 1 on the 2900 level is out 40 feet in quartz. Some of the samples assay as high as $70. Crosscut No. 2, 100 feet north, is not yet in vein, but feeders have been cut, assaying $14. On the 3000 level they are about ready to begin drifting.

The managers of the middle mines are in earnest, and if there is anything in the mines it will be shown up. Nearly every one on the Comstock is waiting anxiously for the result of the explorations now being carried on, and it will gladden the hearts of all if a rich body of ore is found.

At the north end mines everything is going on as usual, there being no change in them of any importance, and the same may be said of the Gold Hill mines.

Bullion Shipments.

King (Calico) February 22, $4,217; Alhambra Mill, 22, $12,063; Barber's Mill, 22, $4,600; Vienna, 17, $43,780; Christy, 17, $1,600; Ontario, 17, $14,743; Germania, 18, $9,548; Wood River ore, 18, $2,723; Stormont, 20, $2,100; Ontario, 20, $15,963; Eureka ore, 21, $2,490; Mayflower, 21, $1,710; Wood River ore, 22, $938; Christy, 28, $1,600; Vienna, 22, $7,640.

The banks of Salt Lake city report the receipt for the week ending February 18th, inclusive, of $15,193.79 in ore, and $49,503.50 in bullion; a total of $64,697.29.

New Incorporation.

KEYES, M. Co. Feb. 24.—Location, California. Capital stock, $410,000. Directors, Geo. T. Marye, Jr., Frederick Getchell, Alfred Wheeler, M. J. Sullivan and P. T. Keyes.

ROCKY PEAK, M. Co. Feb. 24.—Location, Sierra county, Cal. Principal place of business, Brandy City. Directors, James Arnott, Philip Fendingham, Peter Mondada, George S. Cooley, A. D. Cutts; capital stock, $48,000 divided into 24,000 shares.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its colnmns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its valne more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

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ASSESSMENTS.

COMPANY.	LOCA	S. NO.	AMT.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alpha Con M Co	Nevada	19	50	Jan 20	Feb 26	Mar 21	W Willis	309 Montgomery st
Acme M and M Co	California	8	12	Jan 14	Feb 20	Mar 13	J M Buffington	309 California st
Arnold M Co	Arizona	3	1 00	Jan 3	Feb 7	Mar 2	A Judson	320 Sansome st
Belmont M Co	Nevada	18	15	Feb 11	Mar 21	Apr 13	J W Pew	310 Pine st
Black Bear M Co	California	2	25	Dec 20	Feb 20	Mar 17	W L Oliver	328 Montgomery st
Bulwer Con M Co	California	1	20	Jan 13	Feb 24	Mar 31	W Willis	309 Montgomery st
Butte Creek H M Co	California	11	10	Jan 30	Mar 9	Mar 31	R L Taylor	230 Montgomery st
Cueva Santa M Co	Mexico	5	25	Jan 22	Feb 27	Mar 29	W L Oliver	328 Montgomery st
Champion G M Co	California	18	10	Jan 28	Mar 6	Mar 26	T Wetzel	322 Montgomery st
Caledonia M Co	Dakota	15	15	Jan 27	Mar 9	Apr 6	W L Oliver	328 Montgomery st
Con Virginia and California	Nevada	2	20	Jan 15	Feb 20	Mar 21	A W Havens	309 Montgomery st
Eintracht Gravel M Co	California	17	05	Dec 9	Mar 3	Mar 21	H Kuntz	209 Sansome st
Exchequer M Co	Nevada	21	20	Jan 2	Mar 3	Mar 23	C C Elliott	309 Montgomery st
Golconda M Co	California	1	03	Feb 7	Mar 12	Mar 31	J M Buffington	309 California st
Hazard G M Co	California	6	05	Jan 21	Feb 23	Mar 28	J T McGeoghegan	318 Pine st
Homeward Bound Fl M Co	California	3	15	Feb 21	Mar 12	Apr 6	D A Smith	209 Post st
Indian Spring Drift M Co	California	5	03	Feb 19	Mar 23	Apr 23	A B Paul	328 Montgomery st
Independence M Co	Nevada	14	13	Jan 21	Mar 2	Mar 30	J W Pew	310 Pine st
Martin White M Co	Nevada	19	25	Jan 15	Feb 25	Mar 25	J J Scoville	309 Montgomery st
Mammoth Bar M Co	California	7	10	Jan 19	Feb 20	Mar 18	J W Pew	310 Pine st
Mayflow-r Gravel M Co	California	38	10	Jan 20	Feb 27	Mar 20	J Morizio	328 Montgomery st
North Gould & Curry M Co	Nevada	8	05	Jan 12	Feb 13	Mar 2	C H Mason	331 Montgomery st
Ophir M Co	Nevada	49	50	Feb 18	Mar 24	Apr 13	E B Holmes	309 Montgomery st
Peer M Co	Arizona	2	50	Jan 14	Feb 19	Mar 16	A Waterman	309 Montgomery st
Peerless M Co	Arizona	3	50	Jan 14	Feb 18	Mar 14	A Waterman	309 Montgomery st
Potosi M Co	Nevada	17	25	Jan 27	Mar 2	Mar 24	C L McCoy	309 Montgomery st
Savage M Co	Nevada	62	50	Feb 2	Mar 6	Mar 26	E B Holmes	309 Montgomery st
Silver Hill M Co	Nevada	21	15	Jan 9	Feb 13	Mar 6	W E Dean	309 Montgomery st
Sierra Nevada M Co	Nevada	81	25	Feb 18	Mar 25	Apr 14	E S Parker	309 Montgomery st
Union Con M Co	Nevada	29	25	Feb 16	Mar 24	Apr 14	J M Buffington	309 California st
Virginia Creek Gravel Co	California	1	20	Dec 20	Jan 25	Mar 2	J M Quay	406 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
North Peer M Co	Arizona	H Deas	309 Montgomery st	Annual	Feb 27

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	B L Burling	328 Montgomery st	50	Dec 5
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Dec 15
Derbec Blue Gravel M Co	California	T Wetzel	322 Montgomery st	10	Oct 8
Jackson M Co	California	D C Bates	309 Montgomery st	10	Dec 27
Kossuth M Co	Nevada	C K Sturtevant	328 Montgomery st	06	Mar 16
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Feb 13
Paradise Valley M Co	Nevada	W Letts Oliver	328 Moutgomery st	10	Nov 28
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Feb 16
Syndicate M Co	California	J Stadfeldt	419 California st	10	Nov 6

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE. Feb 19-Feb 23	Portland. Rain	Temp.	Wind.	Weather.	Red Bluff. Rain	Temp.	Wind.	Weather.	Sacramento. Rain	Temp.	Wind	Weather.	S. Francisco. Rain	Temp.	Wind.	Weather.	Los Angeles. Rain	Temp.	Wind.	Weather.	San Diego. Rain	Temp.	Wind	Weather.
Thursday	.53	55	S	LR.	.06	60	N	Fr.	.09	57	NW	Fr.	14	59	S W	Fr.	.00	61	W	Cl.	.00	54	W	Cl.
Friday	.14	56	S	Cy.	.00	59	E	Cy.	.00	57	S W	Cy.	00	54	SE	Fy.	.00	66	S W	Cl.	.00	62	W	Cl.
Saturday..	.28	41	N	Cy.	.30	59	NW	Fr.	.03	60	S	Cl.	.07	57	W	Cl	.00	65	S W	Cy.	.00	62	W	Cy.
Sunday	.00	44	NW	Cl.	.00	60	N	Cl.	.00	54	NW	Cl.	.00	55	SE	Cl.	00	64	NW	Cl.	.—	61	W	Cy.
Monday	.00	46	N	Cy.	.00	54	N	Fr.	.00	54	NW	Cy.	.00	58	S W	Cy.	.00	65	S	Fr.	.01	64	S W	Fr.
Tuesday.....	.00	53	S	Cy.	.00	62	N	Cl.	.00	53	N	Cl.	.00	57	N E	Cl.	.00	65	W	Cl.	.00	62	W	Cl.
Wednesday	.19	54	S	LR.	.00	56	E	Cy.	.00	60	SE	Cl.	.00	57	W	Cy.	.00	64	W	Cl.	.00	62	W	Cl.
Totals...	1.14				.36				.12				.21				.00				.01			

EXPLANATION.—Cl, for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature wind and weather at 12:00 M. (Pacific Standard time), with amount of rainfall in the preceding 24 hours.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Feb. 5.		WEEK ENDING Feb. 12.		WEEK ENDING Feb. 19.		WEEK ENDING Feb. 26	
Alpha					.20	.60	.65	
Alta	.27	.30	.25	.30	.30	.40	25	.45
Andes				.10				.10
Argenta								
Belcher	.75	.80						.70
Belding								
Best & Belcher	.75	.70	.80	.70	.75	.50		.90
Bullion	.15	.25	.20	.25		.25		.25
Bonanza King								
Belle Isle			.15					
Bodie Con	1.90	2.00	1.85	2.15	1.85	2.05	2.00	2.10
Benton		.05		.05	.05	.10		.10
Bodie Tunnel								
Bulwer		.10		.05	.05	.30	.25	.30
California		.10		.10	.10	.30	.25	.30
Challenge		.15		.15				.15
Champion								
Chollar	1.45	2.75	2.00	2.65	2.60	3.00	2.50	2.80
Confidence								
Con. Imperial								
Con. Virginia		.10		.10	.10	.30	.25	.30
Con. Pacific			.25	.75	.70	.65	.90	.85
Crown Point		.80	.50	.85		.85	.75	.80
Day								
Eureka Con	2.50	2.75				2.75		
Eureka Tunnel								
Exchequer	.22	.25						
Grand Prize								
Gould & Curry	.60	.90	.65	.70	.60	.65	.50	.75
Goodshaw								
Hale & Norcross	2.85	4.00	3.40	4.05	2.65	4.35	3.70	5.50
Holmes			4.70	5.00	4 50	4.60		4.60
Independence								
Julia								
Justice		.13						.15
Mart White				.15		.45		.45
Mono	1.05	1.15	1.00	1.70	1.25	1.35	1.35	1 50
Mexican	.35	.38		.30	.25	.30		.20
Mt. Diablo	3.50	3.75		3.50				
Northern Belle								
Navajo	1.40	1.65	1.30	1.40	1.00	1.40		1.05
North Belle Isle		.15		.15		.15		.15
Occidental	1.00	.75	.50			.85		.85
Ophir		.35	.30	.35		.30	.10	.15
Overman		.08	.10	.20		.20		.15
Potosi	.50	.85	.65	.50	.75	.90	.75	.80
Final Con								
Savage	.85	1.05	.90	1.00	.90	1.00	.90	1.00
Seg. Belcher			.75	1.10		1.25		
Sierra Nevada	.35	.45	.35	.45		.30	.15	.20
Silver Hill				.10		.10		
Silver King	3.25							
Scorpion	.10	.11				.10		.10
Syndicate	.35	.40		.40		.40	.35	.40
Tioga								
Union Con	.35	.40	.35	.40	.25	.35	.20	.30
Utah	.20	.55			.45	.55	.40	.45
Yellow Jacket	1.20	1.25	1.20	1.35	1.20	1.25	1.20	1.30

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Sales at San Francisco Stock Exchange.

THURSDAY A. M., Feb. 26.

250	Bodie Con	2.00	
200	B & Belcher	.50	@ .55
100	Belcher	.70	@ .70
850	Cbollar	2.50	@ 2.60
700	Con Va & Cal	.25	@ .25
100	Crown Point	.75	@ .75
200	Con. Pacific	.85	@ .85
200	Gould & Curry	.55	@ .55
610	Hale & Nor	3.70	@ 3.75
5	Kentuck	.50	@ .50
50	Mexican	.20	@ .20
1300	Mono	1.50	@ 1.50
50	Navajo	1.02	@ 1.02
100	Overman	.15	@ .15
100	Ophir	.15	@ 100
100	Potosi	.75	@ .75
375	Sierra Nevada	.15	@ 20c
400	Savage		@ 90c
100	Union Con		@ 20c

AFTERNOON SESSION.

600	Alta		@ 30c
200	Benton		@ 05c
400	Bulwer		@ 05c
200	Chollar	2.60	@ 2.65
137	Con Va & Cal		@ 10c
80	Con. Pacific		@ 70c
100	Eureka Con		@ 2.75
500	Hale & Nor	3.65	@ 3.70
160	Mono		@ 1.35
100	Mexican		@ 30c
150	Martin White		@ 15c
400	Sierra Nevada		@ 30c
100	Savage		@ 90c
50	Utah		@ 55c

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Feb. 26, 1885.

ANTIMONY—Per pound		@	—
Hallet's		12½	@ —
Cookson's		12	@ —
BORAX—Refined		7	@ 8
IRON—Glengarnock ton	23 50	@	—
Eglinton, ton	22 50	@	—
American Soft, ton	27 00	@	—
Oregon Pig, ton		@	—
Clipper Gap, Nos. 1 to 4	28 00	@	30 00
Clay Lane White	26 00	@	—
Shotts, No. 1	26 00	@	—
STEEL—English, lb		16	@ 25
Black Diamond, ordinary sizes		13	@ —
Plow		6	@ 8
Machinery		10	@ 12
Sanderso Bros		13	@ —
COPPER—			
Braziers' sizes		—	@ 25
Fire-box sheets		28	@ —
Bolt		22	@ —
Yellow Metal		14	@ 15
LEAD—Pig		3½	@ —
Bar		5	@ —
Pipe		7	@ —
Sheet		8	@ —
Shot, discount 10% on 500 bag Drop, ₱ bag	1 85	@	—
Buck, ₱ bag	2 05	@	—
Chilled, do	2 25	@	—
TINPLATE—Oldcastle	5 25	@	6 00
Charcoal	5 75	@	6 50
Coke	5 25	@	5 50
Roofing	6 25	@	13 10
ZINC—German	9	@	10
Sheet, 7x3 ft, 7 to 10 lb, less the cask	9	@	10
QUICKSILVER—By the flask	33 50		
Flasks, new	1 05	@	—
Flasks, old	85	@	—
NEW YORK PRICES—			
California Borax, refined	8	@	8½
Pig Iron, American No. 1	18 00	@	18 50
Pig Iron, American No. 2	17 00	@	17 50
Quicksilver	47½	@	—
Lead	3 62½	@	3 75
Copper	—	@	11
Tin	17½	@	—
Bar Silver	1 06½	@	—

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List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING FEBRUARY 17, 1885.

312,326.—FRUIT PICKER—Brown & Alcorn, Los Angeles, Cal.

312,435.—GAS MIXTURE FOR INHALERS—L. M. Davis, Walla Walla, W. T.

312,262.—DEVICE FOR RAISING AND LOWERING WINDOWS—Eitel & Hunt, S. F.

312,515.—ROASTED COFFEE BERRIES—A. Schilling, S. F.

312,516.—ROASTED COFFEE BERRIES—A. Schilling, S. F.

312,517.—REIN HOLDER—C. Schoeb, Truckee, Cal.

312,396.—ARTIFICIAL LEG CORD—Menzo Spring, S. F.

312,406.—HOSE PATCH—Geo. W. Towle, Jr., San Rafael, Cal.

11,953.—TRADE MARK—Truman, Isham & Co., S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

RULE-GAUGE.—Jonathan W. Hunt and John Bressler, Crescent City, Del Norte Co., No. 311,584. Dated Feb. 3, 1885. The object of this rule-gauge is to enable the operator to mark off, with the assistance of a rule any stated width hy a continuous line accurately parallel with the edge of tbe material and also to enahle him to draw a line at right angles with the edge, whereby the device serves as a try-square. The invention consists in a plate, preferably of metal, so hent as to be adjusted upon the fingers of one hand, and having a flange against which the rnle bears, and one end at a true right angle with said flange to hear against the edge of the material.

WALL PAPER CUTTING MACHINE.—James C. Van Horn, Livermore, Cal. No. 312,043. Dated Feh. 10, 1885. This device is for trimming wall paper after the paste has heen applied and the paper is ready to he placed on the wall. It consists of a circular rotary hlade, journaled in an adjustable slide, which is arranged to run forward or hack npon a guide ahove the edge, to he cnt or trimmed. This trimming, when done in the old way with a knife and straight edge, is apt to he imperfect, because the knife used in that way will sometimes follow the grain of the board npon which the cutting is done, and hy rnnning out of line will spoil the edge of the paper. With this new rotary knife, fitted in the slide, this is impossihle.

AUTOMATIC FEEDING AND WICK-RAISING LAMP.—Thos. A. Fitzsimons, S. F. No. 311,972. Datcd Feh. 10, 1885. This is a new and usefnl self-feeding lamp and clock attachment for feeding the wick, and it consists in an oil reservoir, from which is suspended, hy an air and an oil pipe, a peculiar cup containing the hurner mechanism, to the wick of whicb a feeding device is applied, to which motion is transmitted to feed the wick hy snitahle gearing, connected with a clock suspended from the top. The object of the invention is to provide a lamp capable of hrning a considerahle time without attention, hy reason of the automatic feeding of the oil and wick, and therefore particnlarly adapted for use in churches as a sanctuary lamp, the light of which is not intended to he extinguished. The further object is to provide in a practical manner for a comhined lamp and timepiece, whereby the functions of hoth may be exercised, and their nses enjoyed together.

JACK-SCREW.—Walter W. Vaughn, Stockton, assignor of part interest to Asa Clark and O. G. Langmaid, No. 310,100. Dated Dec. 30, 1884. In the raising of hnildings or other heavy objects, it has heen a practice to either work with two sets of screws, one of which may he run up to the greatest height, and timhers are put in and another set pnt on, or the weight may he lowered on these timhers and the screws when only one set are nsed, and set npon new blocks for another raise. In some cases, a separahle nut has been used, which may he opened and moved on the screw, after the screw has heen turned through it to the greatest distance. TLe new invention of Mr. Vaughn, consists in a mechanism hy which the screw may be supported after it is raised to its highest point, so that the nut may he relieved from the pressure and "fleeted" or run np to the top of the screw, where it will again he supported hy new timbers, so that the screw may he turned np through the nnt, and the hnilding raised another length, the operation heing continuous without removing either screw or nnt.

FRESH discoveries of silver are contiuually heing made in various parts of New South Wales, Anstralia, several heing of great richness. The popnlation of Silverton, which a couple of years ago had no existence, now exceeds 5,000. Capital to a large extent has heen snbscribed for working the mines, and Silverton is likely to become one of the largest and most flourishing towns in the colony.

DELINQUENT NOTICE.

Fremont Mining and Milling Company.—Location of principal place of business, San Francisco, California. Location of works, Amador county, near Drytown, California.

NOTICE. There are delinquent, upon the following described stock, on account of Assessment (No. 1) levied on the twenty-ninth day of December, 1884, the several amounts set opposite the names of the respective shareholders as follows:

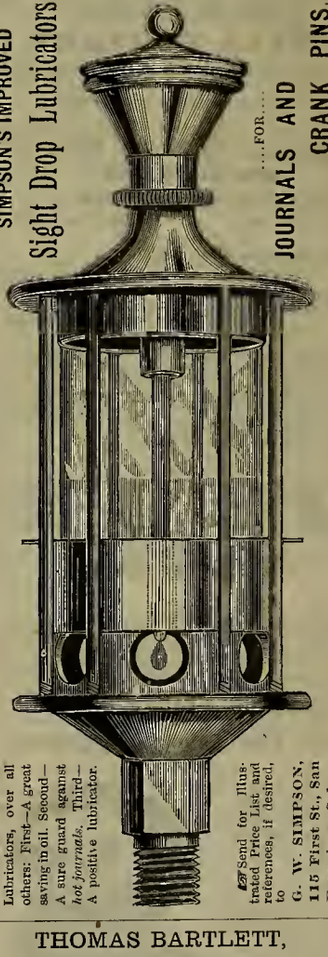
Names.	No. Certificate.	No. Shares.	Amount.
Ames, B W	231	100	$10 00
Ames, D W	666	25	2 50
Adams, Jos L	171	20	2 00
Adams, Edward S	524	20	2 00
Adams, Catherine S	662	15	1 50
Adams, Catherine S	663	10	1 00
Adams, Mrs Susan S	668	10	1 00
Armsby, Ella	1005	5	50
Atkins, Eliza B	122	40	1 00
Atkins, Eliza B	961	10	1 00
Atkins, J C	375	50	5 00
Averill, C W	610	25	2 50
Averill, C W	950	50	5 00
Averill, Charles W	377	50	5 00
Averill, Charles W	633	25	2 50
Bartlett, Wm M	320	25	2 50
Bartlett, John C	325	25	2 50
Bartlett, John G	817	100	10 00
Bacon, Dan'l H	939	10	1 00
Bishee, H R	34	100	10 00
Blanchard, G M	215	20	2 00
Bliss, Samuel	250	100	10 00
Bliss, Samuel	900	100	10 00
Bliss, Samuel	11 0	50	5 00
Bridges, F W	674	50	5 00
Bridges, F W	675	50	5 00
Bailey, Clara E	649	10	1 00
Bailey, Cleora E	453	10	1 00
Bailey, Charles W	578	10	1 00
Bailey, Charles W	703	10	1 00
Bailey, G L	506	20	2 00
Berry, Flora B	1071	6	00
Berry, William R	1072	2	20
Berry, Martin W	1073	2	20
Brooks, J Henry	677	100	10 00
Brooks, Walter D	678	50	5 00
Brooks, John W	1161	50	5 00
Brown, Moses T	573	25	2 50
Brown, Moses T	645	50	5 00
Brown, Moses T	059	50	5 00
Brown, Moses T	740	75	7 50
Buffum, A K P	366	50	5 00
Buffum, A K P	637	50	5 00
Cardwell, S A	261	20	2 00
Cardwell, S A	329	20	2 00
Cardwell, S A	581	10	1 00
Cardwell, S A	1118	20	2 00
Cardwell, A A	520	10	1 00
Cloudman, Frank H	891	10	1 00
Cloudman, Frank A	892	5	50
Clark, Josh H	1086	25	2 50
Cooke, L D	178	20	2 00
Cooke, L D	220	50	5 00
Crowell, E G	587	25	2 50
Coney, G A	601	125	12 50
Coney, G A	743	25	2 50
Coney, G A	934	50	5 00
Coney, Annie E	603	15	1 50
Coney, Anginette	671	12	1 20
Coney, Horace	402	25	2 50
Coney, Horace	403	25	2 50
Coney, Horace	602	50	5 00
Day, Mrs Wm H	718	25	2 50
Day, Wilbur F	201	20	2 00
Day, Wilbur F	468	30	3 00
Day, Wilbur F	557	50	5 00
Day, Wilbur F	639½	20	2 00
Day, Wilbur F	1103	20	2 00
Day, Wilbur F	1146	25	2 50
Dennis, Alice	448	10	1 00
Dennis, Alice M	89	10	1 00
Dennis, Susan L	90	50	5 00
Dennis, Susan L	91	50	5 00
Dennis, Susan D	92	50	5 00
Dennis, Fannie	04	10	1 00
Dennis, Susan	95	10	1 00
Dennis, Delia H	87	30	3 00
Dennis, Delia H	372	20	2 00
Dennis, Delia H	1160	150	15 00
Dennis, J C	871	100	10 00
Dennis, David	320	50	5 00
Dennis, David	1011	100	10 00
Dennis, Henry	535	50	5 00
Dennis, E	98	30	3 00
Dennis, E	454	50	5 00
Dennis, John	455	50	5 00
Dennis, John	456	50	5 00
Dewey, H P	433	50	5 00
Dewey, H P	435	25	2 50
Dewey, H P	436	25	2 50
Dewey, H P	437	25	2 50
Dewey, H P	438	25	2 50
Dewey, H P	939	100	10 00
Dill, Fred W	778	50	5 00
Dill, Grrison	562	50	5 00
Dill, Orrison	563	50	5 00
Dill, Orrison	958	30	3 00
Douglass, Joseph	991	50	5 00
Douglass, Joseph	992	25	2 50
Douglass, Geo W	973	50	5 00
Douglass, Geo W	974	50	5 00
Dorman, Charles D	680	50	5 00
Dorman, Charles D	681	25	2 50
Dorman, James W	682	50	5 00
Drew, J P	38	25	2 50
Drew, J P	39	25	2 50
Drew, J P	40	25	2 50
Drew, J P	41	25	2 50
Drew, J P	42	50	5 00
Drew, J P	43	50	5 00
Drew, J P	223	100	10 00
Drew, J P	402	100	10 00
Drew, J P	403	25	2 50
Drew, J P	404	25	2 50
Drew, J P	405	25	2 50
Drew, J P	805	10	1 00
Drew, Mrs J P	947	25	2 50
Drew, Nellie A	616	25	2 50
Durein, John	1087	25	2 50
Dunnell, Joseph	1010	40	4 00
Dyer, S C	1088	100	10 00
Dyer, S C	1089	100	10 00
Dyer, D W, Executrix	443	15	1 50
Dyer, D W, Executrix	444	15	1 50
Elwell, F M	232	25	2 50
Elwell, F M	1057	25	2 50
Evans, E H	730	10	1 00
Follows, Jabez B	739	50	5 00
Field, Sarah C	574	25	2 50
Field, Sarah C	646	50	5 00
Field, Sarah G	658	50	5 00
Foy, John K	202	10	1 00
Foy, John K	203	10	1 00
Foy, John K	482	20	2 00
Foy, John K	552	100	10 00
Foy, John K	553	100	10 00
Foy, John K	1010	50	5 00
Foy, John K	1095	25	2 50
Foy, John K	1096	25	2 50
Foy, John K	1007	25	2 50
Foy, G W	169	50	5 00
Foy, G W	259	50	5 00
Foy, G W	521	80	8 00
Foy, C W	701	10	1 00
Foy, C W	804	50	5 00
Foy, Harriet K	345	20	2 00
Foy, Harriet K	350	30	3 00
Fuller, W F	1149	50	5 00
Gates, Mary E	917	20	2 00
Gibbons, Wm P	1111	100	10 00
Goding, E L	127	50	5 00
Goding, E L	510	40	4 00
Goding, E L	618	35	3 50
Goding, E L	647	50	5 00
Goding, E L	779	100	10 00
Goding, E L	780	100	10 00
Goding, E L	781	25	2 50
Goding, E L	1098	50	5 00
Goding, E L	1099	50	5 00
Goding, Edwin L	1162	50	5 00
Goding, E	511	40	4 00
Goding, E	610	20	2 00
Goding, E	650	50	5 00
Goding, E	651	50	5 00
Goding, H F	128	10	1 00
Goding, Henry F	1008	20	2 00
Goodrich, Geo B	197	25	2 50
Goodrich, Geo B	199	25	2 50
Goodrich, Geo B	418	50	5 00
Goodrich, Geo B	874	15	1 50
Goodrich, S S	419	25	2 50
Goodrich, S S	420	50	5 00
Goodrich, S S	6 4	50	5 00
Goodrich, S S	935	50	5 00
Goodrich, Samuel S	198	75	7 50
Goodrich, Jacob W	451	25	2 50
Goodrich, Jacob W	452	50	5 00
Gray, Edwin A	33	25	2 50
Gray, Edwin A	1157	25	2 50
Gorrie, Thomas	579	12	1 20
Gorrie, Thomas	653	13	1 30
Gorrie, Thomas	699	10	1 00
Gorrie, Thomas	040	10	1 00
Graves, Mrs Adelaide	841	25	2 50
Graves, Mrs Adelaide	842	25	2 50
Graves, Mrs Adelaide	843	25	2 50
Grant, Peter	1177	20	2 00
Grant, Peter	1178	50	5 00
Grant, Peter	1170	100	10 00
Grant, Peter	1180	100	10 00
Grant, Peter	1181	100	10 00
Grant, Peter	1182	100	10 00
Grant, Peter	1183	100	10 00
Grant, Peter	1184	100	50 00
Grant, Peter	1184½	500	50 00
Grant, Peter	1185	500	50 00
Gray, E A	814	25	2 50
Grant, R H	580	20	2 00
Harper, J W	746	10	1 00
Harley, D F	865	50	5 00
Harley, D F	866	50	5 00
Hathaway, Geo E	877	25	2 50
Hathaway, Geo E	080	10	1 00
Hathaway, Geo	967	5	50
Hildreth, Anna W	710	15	1 50
Hildreth, Anna W	1009	5	50
Hildreth, Horace W	1033	50	5 00
Hayes, R T	76	25	2 50
Hayes, R T	77	25	2 50
Hayes, R T	373	50	5 00
Hayes, R T	060	50	5 00
Horn, James	1102	100	10 00
Hodsdon, Joseph Y	634	25	2 50
Hodsdon, Joseph Y	035	25	2 50
Hodsdon, Joseph Y	036	25	2 50
Hodsdon, Joseph Y	803	125	12 50
Howland, James M	883	30	3 00
Huntington, Samuel L	925	25	2 50
Hussey, C H	897	5	50
Hussey, Robt	890	5	50
Jarvis, R M	733	100	10 00
Jack, Thomas S	631	50	5 00
Jack, Thomas S	727	50	5 00
Jarvis, H N	597	5	50
Jarvis, W H S	598	5	50
Jarvis, Elvira	596	40	4 00
Jarvis, Elvira	1063	50	5 00
Jarvis, Elvira	1064	50	5 00
Jarvis, Elvira	1065	25	2 50
Jewett, Thanklul H	213	40	4 00
Jewett, Thankful H	962	10	1 00
Jewett, James	971	50	5 00
Jewett, Thomas A	121	40	4 00
Jewett, Thomas A	972	10	1 00
Jewett, Harriet A	123	40	4 00
Jewett, Harriet A	600	10	1 00
Jewett, Arthur	839	30	3 00
Johnson, George N	440	25	2 50
Johnson, George N	447	25	2 50
Johnson, F A	939	50	5 00
Jordan, Geo E	875	20	2 00
Jordan, Harriet	347	20	2 00
Jose, Charles E	13	25	2 50
Jose, Charles E	14	25	2 50
Jose, Charles E	15	25	2 50
Jose, Charles E	16	25	2 50
Jose, Charles E	17	100	10 00
Jose, Charles E	208	100	10 00
Jose, Charles E	354	100	10 00
Jose, Charles E	355	100	10 00
Jose, Charles E	356	100	10 00
Jose, Charles E	357	100	10 00
Jose, Charles E	358	100	10 00
Jose, H N	542	50	5 00
Jose, H N	543	50	5 00
Jose, H N	545	50	5 00
Judkins, H E	1080	10	1 00
Judkins, H E	1117	10	1 00
Judkins, H E	1152	25	2 50
Judkins, H G	1093	5	50
Kalley, J N	769	50	5 00
Kelsey, Samuel B	901	100	10 00
Knowlton, H & W J	507	25	2 50
Knowlton, H & W J	508	25	2 50
Landers, H P	867	20	2 00
Lennan, H H	58	25	2 50
Lennan, H H	50	25	2 50
Lennan, H H	328	50	5 00
Lennan, H H	477	50	5 00
Lennan, H H	976	50	5 00
Lennan, H H	1153	100	10 00
Lennan, L	60	25	2 50
Lennan, L	017	25	2 50
Lennan, Lewellyn	327	50	5 00
Lennan, Lewellyn	717	25	2 50
Lennan, Lewellyn	951	50	5 00
Lennan, Lewellyn	981	25	2 50
Leighton, Geo W	254	50	5 00
Leighton, Geo W	702	10	1 00
Leighton, Alvin	710	15	1 50
Leighton, Alvin	1009	5	50
Lincoln, J R	378	50	5 00
Lincoln, J R	660	25	2 50
Lincoln, J R	632	25	2 50
Lincoln, J R	1107	100	10 00
Lincoln, Angeline	348	20	2 00
Lincoln, Angeline	599	30	3 00
Lord, Sarah B	734	20	2 00
Lord, Sarah B	807	10	1 00
Lord, Dan'l B	820	20	2 00
Lord, Charles A	797	50	5 00
Lord, Char'es A	898	10	1 00
Longtellow & Sanborn	638	50	5 00
Longtellow, A G	725	20	2 00
Lohgfellow, A G	757	25	2 50
Lyon, N P	1041	25	2 50
Maginnis, D J	684	25	2 50
Mace, C W	758	10	1 00
Maxey, Louisa	1156	40	4 00
Maxey, Josiah S	694	25	2 50
Maxey, Josiah S	095	25	2 50
Maxey, Josiah S	977	50	5 00
Maxey, Josiah S	978	50	5 00
Maxey, Josiah	73	50	5 00
Maxey, Josiah	74	25	2 50
Maxey, Josiah	75	25	2 50
Maxey, Josiah	465	50	5 00
Maxey, Josiah	466	25	2 50
Maxey, Josiah	515	50	5 00
Maxey, Josiah	516	25	2 50
Maxey, Josiah	517	25	2 50
Maxey, Josiah	518	25	2 50
Maxey, Josiah	970	50	5 00
Maxey, S N	500	10	1 00
Maxey, S N	501	10	1 00
Maxey, S N	522	100	10 00
Maxey, S N	523	100	10 00
Maxey, S N	014	200	20 00
Maxey, S N	673	200	20 00
Maxey, S N	641	10	1 00
Maxey, S N	983	100	10 00
Maxey, S N	1143	25	2 50
Maxey, Ruel S	18	25	2 50
Maxey, Ruel S	19	25	2 50
Maxey, Ruel S	20	25	2 50
Maxey, Ruel S	21	25	2 50
Maxey, Ruel S	22	100	10 00
Maxey, Ruel S	227	100	10 00
Maxey, Ruel L	350	100	10 00
Maxey, Ruel S	490	10	1 00
Maxey, Ruel S	524	100	10 00
Maxey, Ruel S	780	200	20 00
Maxey, Ruel S	1040	25	2 50
Maxey, Ruel S	1052	25	2 50
Maxey, Ruel S	1110	25	2 50
Maxey, Ruel S	1142	25	2 50
McAfee, William	664	100	10 00
Mead, L G	994	50	5 00
Mitchell, Curtis	318	20	2 00
Mitchell, Josephine	530	15	1 50
Mitchell, Jos L	175	25	2 50
Mitchell, Jos L	234	10	1 00
Mitchell, Jos L	967	5	50
Mitchell, Jos L	882	30	3 00
Mitchell, Jos L	964	30	3 00
Mitchell, Jos L	1012	50	5 00
Mitchell, Mrs J L	531	15	1 50
Morrill, Walter H	1105	10	1 00
Morse, Benj J	424	25	2 50
Morse, W W	423	40	4 00
Morse, W W	726	10	1 00
Morse, W W	024	25	2 50
Morse, R F	912	15	1 50
Moore, Henry	473	50	5 00
Moore, Henry	474	50	5 00
Morse, L Francis	670	10	1 00
Morse, L Francis	710	10	1 00
McDonald, James W	35	25	2 50
McDonald, James W	00	25	2 50
Nason, Charles	913	10	1 00
Nickolds, Mrs L C	775	15	1 50
Nickolds, Mrs L G	945	10	1 00
Osgood, J K	879	10	1 00
Palmer, J S	539	50	5 00
Palmer, J S	540	50	5 00
Palmer, J S	731	100	10 00
Plaisted, F A	63	50	5 00
Plaisted, F A	165	50	5 00
Plaisted, F A	764	100	10 00
Plaisted, F A	765	50	5 00
Plaisted, F A	782	60	6 00
Pierce, S G	1139	20	2 00
Partridge, Charles H	829	25	2 50
Partridge, Charles H	830	25	2 50
Phillips, W F	1108	100	10 00
Phillips, W F	1128	100	10 00
Phillips, W F	1129	50	5 00
Phillips, W F	1130	50	5 00
Phillips, W F	1131	50	5 00
Phillips, W F	1132	50	5 00
Phillips, W F	1133	50	5 00
Phillips, W F	1134	50	5 00
Phillips, W F	1135	50	5 00
Phillips, W F	1136	50	5 00
Potter, James E	697	25	2 50
Pratt, Freeman	1158	25	2 50
Preble, Edward E	1154	100	10 00
Preble, Hiram	106	10	1 00
Preble, Hiram	412	10	1 00
Prince, Charles	249	50	5 00
Prince, Charles	309	50	5 00
Prince, Charles	560	50	5 00
Prince, Charles	501	10	1 00
Prince, Charles	916	40	4 00
Ray, George H	471	50	5 00
Ray, George H	815	25	2 50
Ray, George H	1021	25	2 50
Richards, John T	107	100	10 00
Richards, John T	108	100	10 00
Richardson, O	1058	15	1 50
Read, Geo W	586	20	2 00
Reynolds, Mrs Frances	072	13	1 30
Robinson, E C	27	10	1 00
Robinson, E C	28	10	1 00
Robinson, E G	29	10	1 00
Robinson, E C	30	10	1 00
Robinson, E G	31	10	1 00
Robinson, E C	445	20	2 00
Rogers, Geo L	174	20	2 00
Rogers, S W	831	10	1 00
Russell, F H	709	10	1 00
Russell, F H	785	10	1 00
Russell, F H	863	10	1 00
Russell, F H	1046	10	1 00
Sands, Mary A	1022	10	1 00
Sawyer, John E	32	25	2 50
Sawyer, E A	310	100	10 00
Sawyer, J E	449	25	2 50
Sawyer, J E	450	50	5 00
Seabury, R B	62	25	2 50
Sewall, Merrill	82	50	5 00
Sewall, Merrill	83	50	5 00
Sewall, Merrill	230	100	10 00
Sewall, Merrill	331	50	5 00
Sowall, Merrill	417	30	3 00
Sewall, Merrill	736	70	7 00
Sewall, Merrill	805	50	5 00
Sewall, Merrill, Trustee	088	300	30 00
Sewall, S J	130	50	5 00
Sewall, S J	242	50	5 00
Sewall, S J	560	50	5 00
Sewall, S J	570	50	5 00
Small, John C	23	25	2 50
Small, John C	24	25	2 50
Small, John G	25	25	2 50
Small, John G	26	25	2 50
Small, John G	439	100	10 00
Small, John C	441	50	5 00
Small, John G	442	50	5 00
Spear, T H	78	25	2 50
Spear, T H	79	25	2 50
Spear, T H	80	25	2 50
Spear, T H	81	25	2 50
Swett, E G	210	100	10 00
Swett, E G	317	80	8 00
Swett, E C	700	10	1 00
Swett, E G	805	50	5 00
Scribner, Harvey	1023	50	5 00
Shaw, A W	200	30	3 00
Shaw, A W	312	20	2 00
Shaw, A W	729	10	1 00
Sewall, Mary W	245	100	10 00
Smith, Chas F	904	100	10 00
Spiers, James	660	100	10 00
Sturdevant, Gyrus	247	10	1 00
Swift, John L	1147	50	5 00
Swift, Charles	30	25	2 50
Swift, Charles	37	25	2 50
Swift, Charles	365	100	10 00
Swift Charles	367	25	2 50
Swift, Charles	368	25	2 50
Swift, Charles	369	25	2 50
Swift, Charles	370	25	2 50
Swift, Charles	484	50	5 00
Swift, Charles	485	50	5 00
Swift, Charles	850	50	5 00
Swift, Charles	1141	50	5 00
Swift, Charles	1148	50	5 00
Sawyer, W	502	20	2 00
Sawyer, Abel H	720	10	1 00
Sewall, L D	548	50	5 00
Sewall, L D	549	50	5 00
Snow, Evander G	750	50	5 00
Snow, Evander G	1151	50	5 00
Stanwood, Arthur G	679	10	1 00
Spear, Thaddeus	513	100	10 00
Storer, Frederick	705	200	20 00
Storer, Frederick	907	100	10 00
Storer, Frederick	908	100	10 00
Storer, Frederick	909	100	10 00
Storer, Frederick	910	100	10 00
Storer, Frederick	911	100	10 00
Storer, Frederick	1127	275	27 50
Storer, Frederick	1144	25	2 50
Thurston, Stephen R	475	50	5 00
Thompson, Cyrus	1044	20	2 00
Thompson, Cyrus	1045	20	2 00
Tobey, Phineas S	683	10	1 00
Thomoson, Alfred H	1110	5	50
Verrill, A	519	10	1 00
Wakefield, William H	585	20	2 00
Way, A S	74	5	50
Williams, George A	588	25	2 50
Winter, E S	318	100	10 00
Winter, Fred G	870	10	1 00
Winter, Amos G	787	10	1 00
Winter, Ettie M	788	10	1 00
Winter, Lettie	789	10	1 00
Winter, Everett	790	10	1 00
Wood, E C	173	20	2 00
Wood, E C	341	55	5 50
Wood, E G	880	50	5 00
Wood, E C	1003	50	5 00
Woodman, R D	698	10	1 00
Woodbury, George E	1104	20	2 00
Woodbury, George E	1112	10	1 00
Woodbury, George E	1113	10	1 00
Woodbury, George E	1120	10	1 00
Wood, Myranda R	592	50	5 00
Wood, Ray T	44	50	5 00
Wood, Ray T	45	50	5 00
Wood, Ray T	235	100	10 00
Wood, Ray T	321	100	10 00
Wood, Ray T	550	50	5 00
Wood, Ray T	572	50	5 00
Wood, Ray T	1145	25	2 50
York, J S	411	50	5 00

And in accordance with law, and an order of the Board of Directors, made on the twenty-ninth day of December, 1884 so many shares of each parcel of such stock as may be necessary, will be sold at public auction at the office of the company, No. 402 Front Street, room 8, San Francisco, California, on Friday the twentieth day of March, 1885 at the hour of 12 o'clock, M., of such day, to pay delinquent assessments thereon, together with costs of advertising and expenses of the sale.

MARK T. ASHBY, Secretary.

OFFICE—No. 402 Front Steet, San Francisco, Cal.

SIMPSON'S IMPROVED Sight Drop Lubricators ....FOR.... JOURNALS AND CRANK PINS.



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Brodie Rock Crushers,
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Manufacturers of B. E. Henrickson's Patent Automatic Safety Catches for Elevators. All kinds of machinery made and repaired. ☞ORDERS SOLICITED.

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COPPER PLATES
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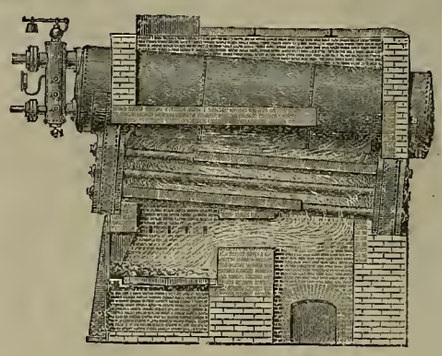
RICHARD C. REMMEY, Agent,
Philadelphia Chemical Stoneware Manufactory,
1100 East Cumberland St., PHILADELPHIA, PA.

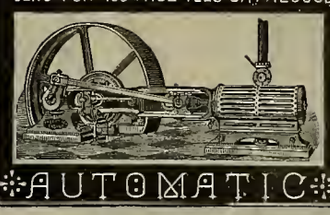
Manufacturer of all kinds of Chemical Stoneware —FOR— Manufacturing Chemists.
Also Chemical Brick Gloover Tower.

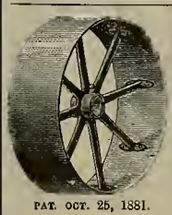
COKE. PATENT COKE.
This COKE is exclusively used by Prof. Thomas Price, in his assay office, by the Selby Smelting and Lead Company, Union Iron Works, Risdon Iron and Locomotive Works, and others in this city. Large supplies are regularly forwarded to consumers in Salt Lake and Nevada, to the Detroit Copper Company, United Verde Copper Company, Old Dominion Mine, and other consumers in Arizona.
The undersigned are in receipt of regular supplies from Cardiff, Wales, and offer the COKE for sale in quantities to suit purchasers.
BALFOUR, GUTHRIE & CO.,
316 California St., San Francisco.

HEINE PATENT SAFETY BOILER
RISDON IRON AND LOCOMOTIVE WORKS.
Sole Agents for the Pacific Coast, - Corner Beale and Howard Sts., San Francisco.
FIRST PREMIUM AWARDED at MECHANICS' FAIR, 1884.
Economy in space and fuel. Safety at high pressures. Freedom from scaling. Equally adapted for power and heating purposes. Especially adapted for mills, factories, hotels, stores or any place where safety is a necessity. Will work well with muddy water and any kind of fuel.
TESTIMONIALS.
SAN FRANCISCO, Sept, 10, 1884.
Risdon Iron and Locomotive Works—Gentlemen: We have had one of your Heine Patent Safety Boilers in use for four months at our Borax Works, in Alameda. It does good work and gives perfect satisfaction. Yours truly,
(Signed) WM. T. COLEMAN & CO.
SAN FRANCISCO, Oct. 4, 1884.
Risdon Iron and Locomotive Works—Dear Sirs: I am using one of your Heine Patent Safety Boilers in my Candy Factory on Twenty-Third street, near Valencia. For economy of fuel, safety and efficiency I have never seen its equal. Very truly yours,
(Signed) W. S. TOWNSEND.

Send for Circular and Prices.

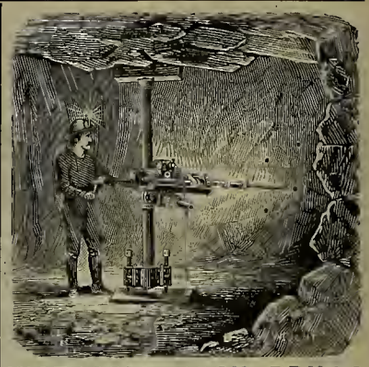
WM. HAWKINS,
MACHINE WORKS,
225 and 227 BEALE STREET,
Between Howard and Folsom, - - - - San Francisco, Cal.
.....MANUFACTURER OF.....
ALL KINDS OF MACHINERY.
PORTABLE HOISTING ENGINES FOR MINES A SPECIALTY.
Jobbing Promptly Attended to.

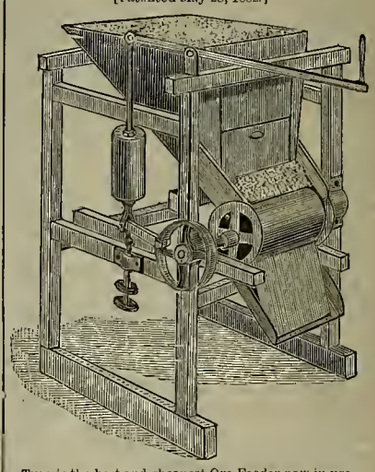
THE GLOBE IRON WORKS CO.
Manufacturers and Repairers of all kinds of
MACHINERY AND CASTINGS
MINING, HOISTING, SAW MILL AND HYDRAULIC PLANTS
LOCCING, PORTABLE, STATIONARY, MARINE AND LOCOMOTIVE ENGINES,
AG'TS DYER CANNON BALL QUARTZ MILL
222 & 224 FREMONT STREET, SAN FRANCISCO.

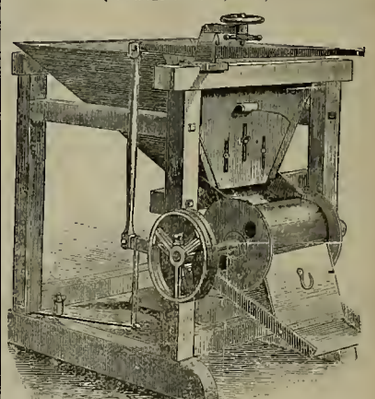
THE CUMMER ENGINE CO.
CLEVELAND OHIO
SEND FOR 150 PAGE ILLS CAT'ALOGUE.

AUTOMATIC
Awarded highest premiums at Cincinnati and Louisville Expositions of 1883, for "Best Automatic Engine." We will furnish anyone copies of the ORIGINAL ENTRIES of several engine builders who claim they were not competing with us. They all entered in the same class with us, and now by deceptive Circulars (one headed "Fact versus Falsehood,") attempt to mislead.
☞*No premiums were offered for Condensing Engines.*
JOSHUA HENDY MACHINE WORKS Agents for the Pacific States, 49 & 51 Fremont St. San Francisco.


PAT. OCT. 25, 1881.
PERFECT PULLEYS
First Premium Awarded at Mechanics' Fair, 1884.
CLOT & MEESE,
Sole Licensed Manufacturers of the
Medart Patent Wrought Rim Pulley
For the States of California, Oregon and Nevada, and the Territories of Idaho, Washington Montana, Wyoming, Utah and Arizona. Lightest, Strongest, Cheapest and Best Balanced Pulley in the World. Also Manufacturers of
SHAFTING, HANGERS AND APPURTENANCES.
☞SEND FOR CIRCULAR AND PRICE LIST.☜
Nos 129 and 131 Fremont Street - - - SAN FRANCISCO, CAL.

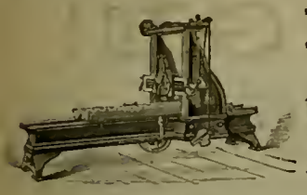
PUMPS IRRIGATING PUMPS
OF ALL KINDS.
200 to 10,000 Gallons a Minute.
SAN FRANCISCO TOOL COMPANY, - - 11 Stevenson Street, S. F.


INGERSOLL ROCK DRILLS
....AND....
AIR COMPRESSORS.
The Latest Improved Ingersoll Rock Drill, with Large Ports, will do 20 per cent more work than the Old Ingersoll.
MINING MACHINERY.
For Catalogues, Estimates, etc., address:
BERRY & PLACE MACHINE CO.,
PARKE & LACY, Proprietors,
12 California Street, San Francisco, Cal.

THE ROLLER ORE FEEDER
[Patented May 28, 1882.]

This is the best and cheapest Ore Feeder now in use.
It has fewer parts, requires less power, is simpler in adjustment than any other. Feeds coarse ore or soft clay alike uniformly, under one or all the stamps in a battery as required.
In the Bunker Hill Mill it has run continuously for two years, never having been out of order or costing a dollar for repairs.
Golden State and Miners' Iron Works
Sole Manufacturers,
237 First Street, SAN FRANCISCO, CAL.

THE ORIGINAL
Roller Ore Feeder.
(PATENTED JUNE 24, 1873.)

This form of Ore Feeder is well adapted for its peculiar work.
Manufacturers of the Celebrated "Challenge" Ore Feeders for wet and sticky ores; also "Stanford Improved" Ore Feeders and Tullock's Ore Feeders for dry ores.
☞Prices furnished upon application to
JOSHUA HENDY MACHINE WORKS,
89 to 51 Fremont St., San Francisco.

SALT LAKE CITY, UTAH. SAN FRANCISCO. CAL. PORTLAND, OREGON.

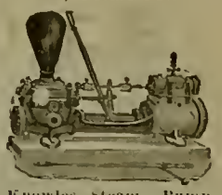


Putnam Planer.

PARKE & LACY.

.....IMPORTERS OF AND DEALERS IN.....

MACHINERY AND GENERAL SUPPLIES,



Knowles Steam Pump
The Standard.

Nos. 21 and 23 FREMONT STREET, SAN FRANCISCO, CAL.

Mining Machinery, Steam Pumps, Wood and Iron Working Machinery

ENGINES and BOILERS.

SOLE AGENTS FOR

Burleigh Rock Drills and Air Compressors,
Putnam Machine Tools,
National Bolt Cutters and Headers,
New York Safety and Haskins Vertical Engines,
Phœnix Engines and Boilers,
Kendall & Roberts' Hoisting Engines,
Knowles Steam Pumps for any service,
Valley Machine Company's Bucket Plunger Pumps,
Heald & Sisco's Centrifugal Pumps,
Jessop & Son's English Cast Steel,
Hazard Manufacturing Co.'s Wire Rope.

SEND FOR CIRCULARS.

PELTON
HURDY-GURDY WATER WHEEL.

SOLE AGENTS FOR

Witherby, Rugg & Richardson's and H. B. Smith Machine Company's Woodworking Machinery,
Novelty Iron Works' Shingle Machinery,
Sturtevant Blowers and Exhausters,
Waters' Governors,
Hancock Inspirators,
Harrington's Screw Hoisting Machines
Leffel Double Turbine Water Wheel,
Pelton's Hurdy-Gurdy Water Wheel,
Babcock Fire Extingusihers and Chemical Engines.

CALIFORNIA WIRE WORKS,

MANUFACTURERS OF

WIRE ROPE, Flat and Round, of the best material and workmanship. Large Stock always on hand. Special sizes made to order.

WIRE Of all kinds for Telegraph and Telephone purposes, Baling Hay, and all purposes that wire can be put to. Brass and Copper—Galvanized. Annealed, Bright and Coppered Wire.

☞ ASK YOUR DEALER FOR ☜

PACIFIC * * WIRE.

TRADE MARK.

Barbed Wire. Sole Licensees on the Pacific Coast for the manufacture of Barbed Wire, Two and Four Point Wire and Flat Barbs.

WIRE CLOTH. Brass, Copper and Steel, all kinds, and meshes from 1 to 10,000 to the square inch.

WIRE FENCING Of various designs for Stores, Banks, Asylums, Gardens, etc.

WIRE GUARDS For the protection of Windows, Skylights, Prisons, etc., etc.

WIRE RAILINGS For House Fronts, Window Sills, Stores Public Squares, etc.

WROUGHT IRON Railing, Fencing, Crestings, Entrance Gates, and Ornamental Work.

Anything in Wire or Light Wrought Iron, Ornamental or Useful,

Go to the CALIFORNIA WIRE WORKS,

BRANCHES—Sacramento, Los Angeles and Portland. No. 329 Market Street, Cor. Fremont, San Francisco, Cal.

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IRVING M. SCOTT, Gen'l Manager. J. O'B. GUNN, Secretary.

UNION IRON WORKS,

Office, Cor. Market & Fremont Sts., S. F. Location of Works, Potrero. P. O. Box 2128.

— BUILDERS OF —

STEAM, AIR, AND HYDRAULIC MACHINERY.

Agents of the Cameron Steam Pump.

Home Industry. All Work Tested and Guaranteed.

VERTICAL ENGINES,
HORIZONTAL ENGINES,
AUTOMATIC CUT-OFF ENGINES,
COMPOUND CONDENSING ENGINES,
SHAFTING,
BABY HOISTS,
VENTILATING FANS,
ROCK BREAKERS,
SELF-FEEDERS,
PULLEYS,
STAMPS,
PANS,
SETTLERS,
RETORTS,
ETC., ETC.

TRY OUR MAKE CHEAPEST AND BEST IN USE.

UNION IRON WORKS

Successors to PRESCOTT, SCOTT & CO.

SEND FOR LATE CIRCULARS. SEND FOR LATE CIRCULARS.

L. C. MARSHUTZ. T. O. CANTRELL

National Iron Works,

Northwest Cor. Main and Howard Sts., San Francisco,
MANUFACTURERS OF

IMPROVED PORTABLE HOISTING ENGINES

At Greatly Reduced Prices.

HOME INDUSTRY! ALL WORK TESTED AND GUARANTEED!

Stationary and Compound Engines, Flour, Sugar, Quartz and Saw Mills. Amalgamating Machines.

CASTINGS AND FORGINGS OF EVERY DESCRIPTION.

Sole Manufacturers of Kendall's Patent Quartz Mills.

Pacific Rolling Mill Co.,

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MANUFACTURERS OF

RAILROAD AND MERCHANT IRON,

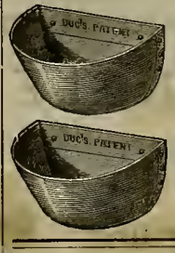
ROLLED BEAMS, ANGLE, CHANNEL AND T IRON, BRIDGE AND MACHINE BOLTS, LAG SCREWS, NUTS WASHERS, ETC., STEAMBOAT SHAFTS, CRANKS, PISTONS, CONNECTING RODS, ETC., ETC.

Car and Locomotive Axles and Frames, and Hammered Iron of Every Description.

HIGHEST PRICE PAID FOR SCRAP IRON

☞ Orders Solicited and Promptly Executed.

Office, No 202 Market St., UNION BLOCK.



THE "DUC" STEEL BUCKET!

Always First Premium in Competitive Trials.

Extra Strong and Very Durable.

Made of Best Charcoal Iron. Only One Seam. No Corners to Catch. Runs with Least Power.

☞ BEST MINING BUCKET MADE. ☜

H. P. GREGORY & CO., Agents, San Francisco.

PRICES GREATLY REDUCED.

IRON CLAD MANUFACTURING CO.,
22 Cliff Street, New York.

THE JENKINS STANDARD PACKING

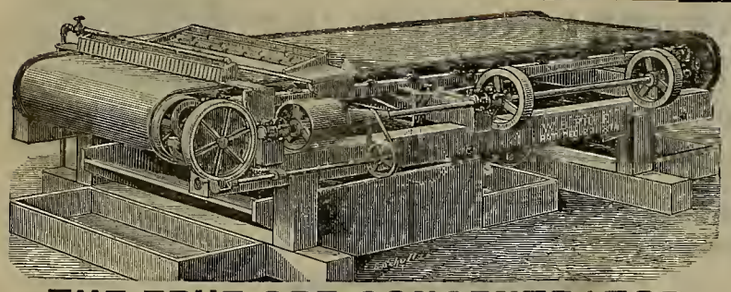
IS ACKNOWLEDGED BY USERS AS THE BEST in the world. Unlike all other Packings, the **Jenkins Standard Packing** can be made any thickness desired in a joint by placing two or as many thicknesses together as desired, and following up joint, it vulcanizes in place and becomes a metal of itself (it is frequently called Jenkins Metal), and will last for years, as it does not rot or burn out. Avoid all imitations, as a good article is always subject to cheap imitations. The **genuine** has stamped on every sheet "**Jenkins Standard Packing**," and is for sale by the Trade generally,

Manufactured only by

For Sale by DUNHAM, CARRIGAN & CO., San Francisco, Cal. JENKINS BROS., 71 John St., New York.

$1,000 CHALLENGE!

C Hendel Apr24 '85



THE FRUE ORE CONCENTRATOR,
OR VANNING MACHINE.

PRICE: FIVE HUNDRED AND SEVENTY-FIVE DOLLARS, ($575 00), F. O. B.

OVER 1,000 ARE NOW IN USE. Saves from 40 to 100 per cent more than any other Concentrato r Concentrations are clean from the first working. The wear and tear are merely nominal. A machine can he seen in working order and ready to make tests at the Fulton Iron Works, No. 220 Fremont Street, San Francisco.

As the result of a suit East against an End-Shake Machine (the Embrey), similar to the Triumph, the Frue Vanning Machine Company owns the Embrey patent, an ' can put in the market an End-Shake Machine of earlier patent that will do as good work as the Triumph, and superior in construction and durability. There will be no risk of suit for infringement.

The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement on patents owned by them.

Protected by patents May 4, 1869, Dec. 22, 1874, Sept. 2, 1879, April 27, 1880, March 22, 1881, Feb. 20, 1883, Sept. 18, 1883. Patents applied for.

N. B.—We are and have been ready at any time to make a competitive trial against the Triumph, or any other Concentrator for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Co.,
Room 7—No. 109 California Street, - - - SAN FRANCISCO, CAL.

PACIFIC IRON WORKS
1850. 1885.

RANKIN, BRAYTON & CO.,
....BUILDERS OF....
MINING MACHINERY.

San Francisco: 127 First Street. Chicago: 100 N. Clinton. New York: 145 Broadway.

PLANTS FOR GOLD AND SILVER MILLS, embracing machinery of LATEST DESIGN and MOST IMPROVED construction. We offer our customers the BEST RESULTS OF 35 YEARS' EXPERIENCE in this SPECIAL LINE of work, and are PREPARED to furnish from SAN FRANCISCO or CHICAGO, the MOST APPROVED character of MINING AND REDUCTION MACHINERY, adapted to all grades of ores and SUPERIOR to that of any other make, at the LOWEST POSSIBLE PRICES.

We are also prepared to CONSTRUCT and DELIVER in COMPLETE RUNNING ORDER, in any locality, MILLS, CONCENTRATION WORKS, WATER JACKET SMELTING FURNACES, HOISTING WORKS, PUMPING MACHINERY, ETC., ETC., of any DESIRED CAPACITY.

WATER JACKET SMELTING FURNACES

For COPPER and ARGENTIFEROUS LEAD ores of NEW and ORIGINAL DESIGNS, covered by LETTERS PATENT. No other Furnace CAN COMPARE with these for DURABILITY, and in CAPACITY for uninterrupted work. MORE THAN 150 of them are now RUNNING in various parts of THIS COUNTRY, as well as many in FOREIGN COUNTRIES, giving results NEVER BEFORE ATTAINED as regards CONTINUOUS running, ECONOMY of fuel, AMOUNT and QUALITY of BULLION produced. These CLAIMS have been PROVEN BY RESULTS in ANY NUMBER of INSTANCES, and the GREAT SUPERIORITY of this SYSTEM of smelting ores DEMONSTRATED BEYOND QUESTION. COMPLETE PLANTS furnished to order of any CAPACITY, with ALL IMPROVEMENTS that experience has DEMONSTRATED as VALUABLE in this class of work.

WATER JACKET SMELTING FURNACES

THE DUNCAN CONCENTRATOR

Beyond question the cheapest and most effective machine of the kind now in use adapted to all grades and classes of ores.

This machine has been THOROUGHLY TESTED for the past TWO YEARS, under a GREAT VARIETY of CONDITIONS, giving most EXTRAORDINARY results FAR IN ADVANCE of anything EVER BEFORE REALIZED. A recent COMPETITIVE TEST at the Carlisle Mine in Mexico, showed an ADVANTAGE OF OVER 30 PER CENT in favor of THE DUNCAN. The amount SAVED OVER THE FRUE being sufficient to PAY THE ENTIRE COST of the machines EVERY MONTH OF THE YEAR. One of its MOST VALUABLE features is as an AMALGAMATOR. It saves all THE AMALGAM GOLD and SILVER that ESCAPES the BATTERIES, PANS or SETTLERS, making the machine worth MORE than ITS COST for THIS PURPOSE ALONE.

HOISTING WORKS

Of late and improved design with all known appliances for safety and efficiency to work to any depth and of any desired capacity. Complete shaft equipment, such as safety cages, landing dogs, cars, turn-tables, ore and water buckets, skips, etc., etc., for either vertical or incline shafts.

PUMPING MACHINERY

Adapted to all Requirements.

HOISTING WORKS

JOSHUA HENDY MACHINE WORKS.

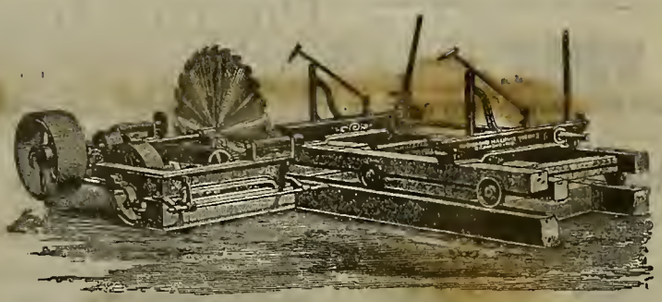
Incorporated September 29, 1882.

Nos. 39 to 51 Fremont Street, - - - - - - - - - - San Francisco, Cal.

.....MANUFACTURERS OF.....

NEW and Dealers in SECOND-HAND BOILERS, ENGINES and MACHINERY
OF EVERY VARIETY.

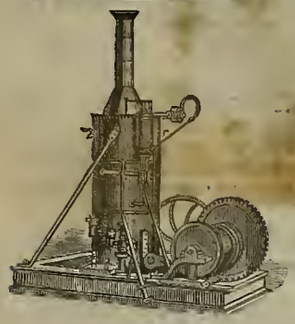
Steam Pumps of all Makes,
CENTRIFUGAL PUMPS,
MINING PUMPS.
BLOWERS AND EXHAUST FANS.
LEATHER AND RUBBER
BELTING.



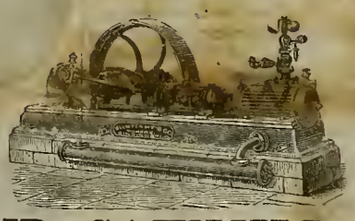
IMPROVED SINGLE AND DOUBLE CIRCULAR SAWMILLS.

SHINGLE MILLS.

WOODWORKING MACHINERY,
.....COMPRISING.....
Band Saws,
Stickers,
Planers,
Shapers,
Etc., Etc.



STATIONARY, PORTABLE,
.....AND.....
Hoisting Engines
.....AND.....
BOILERS.



MINING, QUARTZ, AND SAWMILL MACHINERY.

AUTOMATIC ORE-FEEDERS, HENDY AND TRIUMPH CONCENTRATORS.

—AGENTS FOR THE SALE OF—

Baker Rotary Pressure Blowers, Akron (Ohio) Hot-Polished Shafting,
Wilbraham Rotary Piston Pumps, Blaisdell & Co.'s Machinists' Tools.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, MARCH 7, 1885.

VOLUME XLXX
Number 10.

Electric Mining Machinery.

The latest improvement in mining machinery is that of the "Wiswell Electric Ore Pulverizor and Amalgamator Combined," an engraving of which is shown on this page, and which will interest mining men. It is confidently claimed by the manufacturers that this mill is capable of doing more and better work than others heretofore offered to the mining public. The points of superiority of the Wiswell Electric Mill and Amalgamator claimed by the company are as follows:

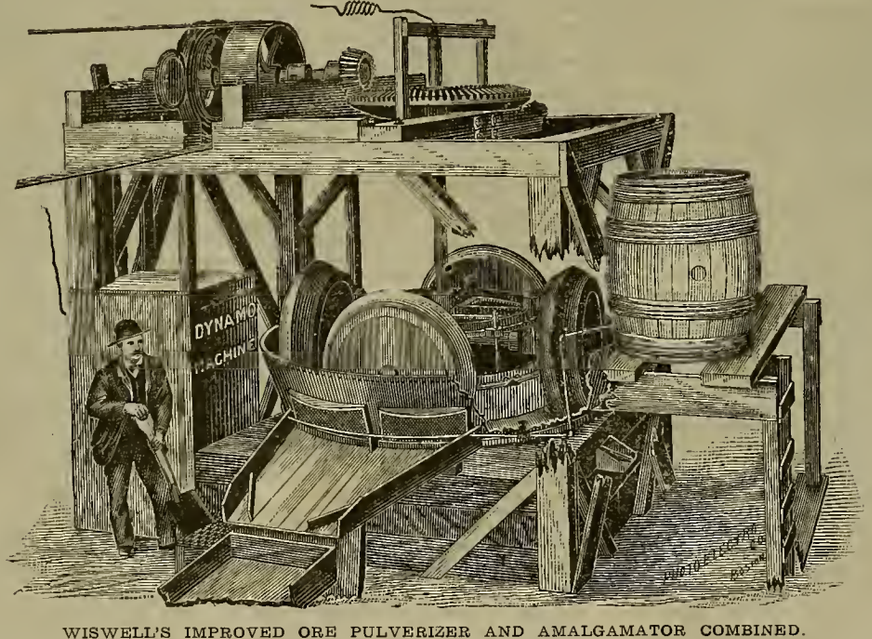
"First, that its first cost is not one-half the cost of a stamping battery of sufficient capacity to do the same amount of work; second, it takes but half the power to run it; third, the wear and tear of the mill is not one quarter part that of a 20-stamp battery; fourth, the quality of work done by it is superior to that of the stamp mill; it makes no slimes, crushes to uniform fineness, does not flour mercury, and can be cleaned up in five minutes without stopping the mill, simply by discontinuing the feed and opening the tap-off flow; fifth, amalgamation may be carried on in the same operation with the pulverizing, by placing the mercury in the mill while grinding, and tapping off the amalgam at suitable intervals without stopping the mill or interfering with the grinding; fresh mercury being put in to replace that drawn off in the amalgam; in this way the pulverization and amalgamation is carried on simultaneously and continuously throughout the 24 hours."

"Sixth, and chiefly, the long and earnestly sought for application of electricity to the operation of disintegrating the ore, and accelerating the process of amalgamation, has at last, by this mill, been practically and successfully accomplished. By certain processes patented and owned by this company, a constant current of electricity, of any desired force, is passed through the pulp while saving grinding, resulting in the of from 25 to 30 per cent more gold or silver, than can possibly be accomplished without it. Extravagant as this statement may seem, it has been more than fully borne out by actual test and experiment; the average result of numerous experiments with free-milling and sulphuret ores being a saving of 78½ per cent of the gold contained in the ores, as shown by fire assay when worked with electricity, as against an average saving of 52 per cent from precisely the same ores, when worked without electricity. The establishment of these facts is sufficient to show that this mill, with its electrical attachments, is destined to effect a complete revolution in mining."

The following paragraph from the circular of the company shows the claims concerning the electrical action:

"To those familiar with the results of the experiments that have from time to time been made to test the effect of electricity in separating gold and silver from pulverized ore, no explanation is needed to account for the astonishing results here claimed. But, for the benefit of readers who may be entirely unacquainted with the facts proved by the experiments of past years, we will simply say that the effect of the electric current in the pulp is to entirely cleanse the particles of gold and silver from every kind of tarnish, and it not only precipitates the float gold or silver which has hitherto proved so vexatious a source of loss in milling operations, but it quickens the action of the mercury and keeps it in the best possible condition for saving the precious metal, and thus, by overcoming the two chief obstacles at present existing to successful amalgamation, insures the saving of at least eighty per cent of the precious metal contained in the ores."

Numerous machines are being put up in this and adjoining States, and the company feel assured that the result of their performance will be such as to justify the statements here made. The office of the "Wiswell Electric Mining Machinery Co." is at 106 Leidesdorff St., San Francisco, where any further information can be obtained; and one of the mills can be seen in actual operation every Tuesday and Friday afternoon, at 461 Howard street, next to the shot tower.



WISWELL'S IMPROVED ORE PULVERIZER AND AMALGAMATOR COMBINED.

THE secretary of the Immigration Association states that great numbers of men, out of employment have called upon him during the last few days, seeking work, a great many of them foreigners, and also numbers from Oregon and Washington Territory. The association wishes it stated that it has never advised immigrants to come here unless they have $100, $500 or $1,000, and also wish to make known that it is only at certain periods of the year that there is a great demand for labor.

UNIONVILLE, in Humboldt county, Nev., is experiencing a revival, and rich ores are being found in several old claims. The district was one of the first organized in that county.

LARGE amounts of gypsum are being constantly shipped from the quarries near Point Sal to San Francisco, where it is converted into plaster-of-paris.

Testing Gold Dust.

It is important in estimating the value of purchased gold dust, to carefully examine to see if there is any counterfeit or "hogus" dust present. If all from the same locality, the dust will have a uniform color. Any suspicious looking pieces should be set aside, and cut with a cold chisel while lying on a small anvil. A fair sample of the whole lot of gold dust under examination should then be placed in an evaporating dish, the suspected pieces being placed on top, and nitric acid poured over them. If any reaction takes place, such as effervescence or evolution of red fumes, or if the acid becomes colored, there is foreign matter present, and should this be the case, counterfeit or adulterated gold dust must be suspected. State Mineralogist Hanks gives the following method of manipulation for the detection of bogus gold:

Place two watch glasses, one on a piece of white paper, and the other on black or other dark color; then, with a glass rod, convey a few drops of the acid from the dish to each. To the white, add a drop or two of ammonia, until it smells strongly ammoniacal; a blue color indicates copper. To the other add hydrochloric acid in the same manner. If a white curdy precipitate forms, which does not dissolve upon the addition of water, silver is being dissolved from the gold dust in the evaporating dish. If the dust is of very low grade, these metals may dissolve in very small quantities. But such gold dust would be easily detected by its inferior color and appearance.

If no action is observed, even after heating the dish, there is no counterfeit present. Counterfeit gold dust is sometimes so heavily coated with pure gold (by the galvanic process) as to protect the base alloy from the action of nitric acid, hence the necessity of cutting all suspected pieces before submitting to the action of the acid. To remove the acid from the gold, wash with water thoroughly, and dry over the spirit lamp.

Sierra County Notes.

Bald Mountain Extension Company, Forest City, have cleaned up over $5,400 for February. Nearly 50 men are employed. Last Saturday night the steel wire cable broke while loaded cars were descending the incline, 260 feet long. One of the boys, by the name of Veal, employed at the mine, had the rare courage and presence of mind to jump on an empty car and chase the fleeing train down the tunnel, over 6,000 feet in length, and fortunately overtook and stopped it before the cars collided with the incoming train. Just now developments indicate the lead extends north. Everywhere underground there is a very curious and strange looking country.

Four feet of snow at Gold Lake, and five on encircling ridges. The snow is as hard as ice. The miners are ensured a good water season. Snow at Howland Flat is less than two feet deep. Most all the miners in Northern Sierra are working their claims, there being so little snow and not stormy weather enough to interfere with their operations. There are three and a half feet of snow on the summits. The miners are praying for more snow that must soon come.

Company Red Oak, near Saddle Back, are now in soft picking slate bedrock, and apparently near their pay lead. For a long time past, the rock was so hard that but eight feet a month was made, blasting with giant powder. Eugene Dewey, of San Francisco and New York, is largely interested in this property.

The Bald Mountain Company, Forest City, cleaned up last Sunday from the preceding week's labor 200 ounces. Their richest gravel, at the bottom of incline under the lava flow that cut away the upper channel, is very hard and requires blasting. One man is only able to roll out three carloads on a shift of ten hours. The lead is quite narrow. It costs $4 per carload by the time the gravel reaches the dump. The theory is that this fabulously rich channel extends for thousands of feet beneath the lava flow. If so, then the Bald Mountain Co., heretofore only coming back with their pillars, will have another indefinite lease of prosperity.

THE new Selby Reduction Works, Contra Costa county, near the Vallejo Junction, are being rapidly pushed to completion. The main building, next to the railroad track, is to be 350 feet in length, and already about 250 feet of the walls are up and roofed. There will be about 350 men employed. A 20-foot dam is being constructed near the head of Cervo Valley, forming a large reservoir to supply the works with water. The aqueducts, gates, etc., will cost about $14,000.

MR. J. B. RANDOL, of the New Almaden Quicksilver Mining Company, has presented a handsome gold watch and chain to engineer John Tonkin, of whose nerve in standing at his post at the time of the late boiler explosion at that place, saved the lives of the miners in the cage.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Legislative Relief for the Hydraulic Miners.

EDITORS MINING PRESS:—No person who mixes much with the more intelligent portions of this community can fail to have noticed how generally the decision of Judge Sawyer, in the Mining Debris suit, is condemned even by parties having no direct interest in the issue of that suit. Not that this opinion is always demonstrative, or even very pronounced, yet a conviction that an injustice has been done the hydraulic miners appears to be fixed and widespread, showing that the public conscience is uneasy on the subject, and that it cannot be reconciled to a policy, which, if adhered to, must inevitably work great hardships to so many of our citizens. Nobody questions the motives, the learning or the ability of Judge Sawyer, yet nearly everybody seems to feel that a great wrong has been done, and that it ought to be righted. The law may be against the hydraulic miners; the farmers may assail, and the newspapers denounce them, and still this latent sympathy will continue its spontaneous workings among the disinterested masses. Any judicial finding that fails to take in a fair share of the equities on both sides can never be final. The trouble in such settlement of issues is that they will not stay settled. Every rank injustice resurrects itself after it is thought to have been committed to final sepulture. Even when passed on by the court of last resort, a case of this kind is not disposed of. After it has been adjudicated by this tribunal, the party feeling aggrieved will appeal to the law making power for relief. Here is where it must ultimately go for correction, be the results in the courts what they may. As the representatives of the people, any action taken by the Legislature would, as embodying public sentiment on this subject, presumably prove satisfactory to all.

This being the case, why not pass the bill lately introduced by Senator Cross, in the Legislature now in session at Sacramento, and which, having been favorably reported upon by the committee on mines, to whom it was referred, there is reason to hope will be enacted into a law. This bill provides that parties interested in hydraulic mining may incorporate for the purpose of building dams and other works for retaining and impounding the debris from such mines, authorizing them to take under the law of eminent domain any ground required in the construction of these works. All monies needed to the above end are to be raised by assessment of the stock of the companies, ten per cent thereof being made payable to the State Treasurer to raise a fund out of which the dams are to be kept in repair, in case this should not be done by the companies. After these retaining structures have been built, it is, of course, understood that the hydraulic miners who have been estopped running shall be allowed to resume operations.

With a law like this, the miners would be restored to the status they occupied under Judge Temple's decision, who held that as soon as the *heavier* debris is completely impounded, the miners may again go on with their work. Judge Sawyer, on the other hand, made his injunction perpetual, suggesting that, if in the future any plan were adopted whereby the injuries complained of could be *wholly obviated*, then the court might be induced to modify the decree, or possibly suspend the injunction altogether. This is looked upon as equivalent to saying that work under no possible circumstances shall be resumed, inasmuch as the miners could not so effectually impound these slums, that no injury whatever could result to interests and properties below.

It is not my purpose to discuss at length the merits of a question that has already been so thoroughly investigated in the courts, but to merely invite public opinion to the fact, that it would be to the interest of all, that it should be disposed of by the Legislature, which can better deal with all the facts and equities in the case than it would be possible for the courts to do. This is a case in which the concessions cannot all be wrung from one side. Each must yield, and each suffer something. To attempt its adjustment on any other basis is simply to make it a judicial heir-loom that would lead to interminable contests between two of the leading industries of the State. HENRY DEGROOT.

San Francisco, Feb. 28, 1885.

WATER POWER.—There is sufficient water-power in South Carolina to turn the spindles of all New England, and yet most of the rivers run down to the sea unimpeded in their flow. The streams are never closed by ice, and they rarely ever rise so high as to interrupt the running of the mills that have been established on her banks. On every side there are the crude materials for the manufacture of almost an endless variety of useful and ornamental articles of commerce. The matchless climate and vast resources make South Carolina a paradise for manufactures. Enterprise and capital will soon utilize the superior facilities of the South to their fullest extent.

Just What's the Matter.

What all Want is More Money—Gold is King

Mr. Almarin B. Paule, the well-known mining man, contributes to the *Bulletin* the following terse and vigorous article, which might set the people of this city thinking of the future possibilities of our mining industry:

Years ago—yes 30 years ago, I first took up my pen to write for the *Bulletin*, in the interest that has done more to build up this State—to build up real estate, banking and individuals, than all the other industries combined, to-wit: Mining. Mining was the great invigorator of an energetic people, and it is to-day an interest and an industry that is to control the destiny of our people and State, for, with mining, hope will ever bring forth all the energies of man. History shows that in all ages when mining for gold and silver was the excitement, that civilization made the more rapid strides, and the masses were the more prosperous and happy. The golden age of Rome, was gilded by the treasures from her mines. The Dark Ages was the result of a vast decline in gold production. The grandeur of Spain was when Cortez unearthed the golden treasures of the Western world. California and Australia's gold production sent the world ahead hundreds of years, from what it would have been, without the $3,000,000,000 unearthed. It saved the civilized world from bankruptcy, misery and civil wars. It made men bold, energetic and thoughtful and these thoughts came from vigorous, healthy blood, and which has produced wonders for enrichiug mankind. When men have plenty of gold in their pockets, they think clear and with boldness—not only think boldly, but act boldly. They dare to do. And right here let me say, that the trouble of California to-day is, that we have been too neglectful of our gold industry. We have sought rather to destroy its productiou, overlooking the fact that "Gold is King" under all and every circumstance. It is a reproach, I admit, on the civilization of the age, that it is, but, being so, we must argue all things from conditions as they are. California has fallen off in product from $24,000,000 average which it held for ten years after the Comstock raided upon our mining capital, to but little over $15,000,000; a forced decliue, through these tirades against miuing—tirades backed too much by the agricultural, banking and mercantile interests, and now who suffers in business more than they? We hear men talk of "booms"—"booms" in real estate, "booms" in vineyards, "booms" in trade, and here let me ask how can there be any booms until the *people* have money to boom on? Oue will say money. Why the saving banks have $52,000,000 on deposit! On deposit? Where is it? I will answer, loaned on real estate—then where is the money? There is no getting a boom out of anything until we produce more gold to do business on.

Of all cities in the known world, uo city could revel in such golden grandeur as San Francisco, were the mining interest of this State properly appreciated, eneouraged and pressed forward. Some may say, we have millions in our commercial banks lying idle. What does the banking statistics of our twenty commercial and savings bank show—$8,357,000 as cash on hand, and $30,000,000 invested and loaned on bouds and stocks—mainly in bonds. Are bonds productive for the masses? Do they give employment to the laborer or needy? Lying idle in he vaults do they build manufactories? On the contrary, it is locked up money as far as being of any benefit to this community, outside of coupons. Then how much floating money have we out of a combined banking capital of some $116,000,000—less than $9,000,000, and to whom does this money belong? The few, not the many. Does this condition of things make prosperity for a people or State? Bu iness men ask "What is the matter?" Is it not clear just what is the matter? On all sides the cry is "Hard times—over-production." Would there be hard times if we had gold pouring into our vaults, as formerly, when the *extra* product every year over the present was equal to the sum total of cash on hand in all the commercial and savings banks of the city? Can there be any over-production of this metal, even though the whole populatiou of the State were engaged in mining? Prosperity in business comes from an abundance of circulating medium; hard times, from the contraction of it; hence under-consumption. For better times, as before stated, the *people* must produce more gold, and to produce we have got to mine for it. To build up San Francisco the community has got to build up, not tear down, one of the most valuable interests of the State.

The Flush Times of the Past.

Recall the "flush times" of the past, and what made them flush? The product of California and Nevada mines—*the solid gold and silver*. All metal produced is so much added to the world's supply—that received from grains, wool and wine is simply exchange—taken from Peter to pay Paul, but that from mother earth enriches all. I have spoken of Rome, in all her golden grandeur; with all her vast mineral domain, she had no golden fields of wealth, as has the people of this city, within a forty-eight hours' ride, and were our people to awake from their lethargic sleep, and show the enterprise and industry of the old Pioneers, they could build abodes, to rival the magnificent Palace of Ecbatana. Our moneyed men are given too much to "cent per cent," not development. There is certainly a great lack of stirring enterprise, compared with the past. California seems paralyzed; not wide awake to advancing her interests. Take, for instance, the New Orleans Expositiou. To be sure the State has appropriated $10,000, after considerable effort and loss of much valuable time. Take the Denver Silver Convention, which over one thousand delegates attended from the mining States and Territories, but no representative from California. Who should be more interested in this silver question than the business men of this city? The "great" commercial city of San Francisco, with the Orient facing us—with India alone, consuming $10,000,000 of silver per annum, which we, of this coast, should supply.

Silver in California.

Some may say California is only a producer of gold, not silver. This is an error. The whole White Mountain, the Inyo Range, and lower Sierra Nevada, are stored with silver. For more than 150 miles a silver belt is awaiting muscle and capital to develop it. In this question of the production of the precious metal, much is to be considered. Lessen the production and at the same ratio, lower must come the wages of every man who labors. The very tirade of the granger against hydraulic mining lessened the gold product in the past six years fully $50,000,000, and kept at least $30,000,000 of mining capital from coming to this State.

Relations of Labor to Mining.

The present trouble with our foundries and their wage-workers can all be traced to the past tirade as the cause of it. It threw thousands of men in the mountains out of employment, lessened the demand for machinery, and the recoil is now before us, not only with the foundries and their workers, but the entire business of the coast has to suffer. Not only is labor involved in this question, but the consequences of no work—poverty and an unsettled condition of society. Why? one will ask. Because all values are based on gold. It's all a simple, economic proposition, which a schoolboy should understand, and yet some very wise old men and "righteous" judges think that to keep muscle and money out of mining is bestowing a blessing, when, in fact, it is the fostering of poverty and distress. Taking into consideration the fact that gold plays so important a part in all the business and social relations of nations and individuals, and the further fact of its great decline in production, and its increased consumption in the arts, makes California, Australia and Siberia (which are the great gold-producing sections) localities of vital interest. We do not appreciate our wealth, or we would act with greater wisdom.

Influence on Trade.

What seems so surprising is that intelligent business men do not seem to consider the importance of the question of greater or less production of the precious metals, and as having so serious a bearing on trade and the value of labor, with its consequences, and particularly in this State. This I thus illustrate: The Chamber of Commerce when appointing committees for reports on the vital interests of this State, in order to find out what was the cause of depressed trade, left out mining, as having no bearing, or else from fear of a back lick from the granger. All this shows a short-sightedness (to be charitable) on the part of our broad-brained (?) commercial magnates. Well, the miner can stand it. "Gold is King," which the granger finds out as his mortgages come due and go under the sheriff's hammer for the lack of it. Some oppose mining because it is a gambling business. Well, what is not? Life is a gamble. Grain is a gamble. Marriage is a gamble. All mercantile pursuits are a gamble, and so much so that only about ten per cent avoid failure. And where is a bigger gamble than life, marine and fire insurance? And tell me is mining a higher gamble, conducted with capital, skill and economy? Now to review: We have got to revive mining. With our other material interests as they are, our very prosperity depends on it. To relieve labor, to save revolt, we must produce more gold. Every one, even though he does not mine, builds up his interests by giving aid and encouragment to those who do. When I speak of mining, I mean legitimate work, conducted with skill, honesty and economy. Thus a blind man can see what is the main trouble with business in this State. Now, how shall we improve it? As before expressed, build up that interest which brings forth new capital and more of it. Let mining receive its proper encouragement from every other interest. Let our miners push forward with more spirit, using the highest skill and economy for profit. The future will want all the gold that can be produced, for the world over Gold is King, and is yearly becoming more powerful. It is not elevating or encouraging to know that it is so; and here let me ask, how long will the financial world force it to rule the destinies of humanity.

San Francisco, February, 1885.

BOX WOOD.—The demand for box wood for engravers' use has so largely increased that the supply is running short, and the price is rising. The fineness of grain and toughness of fiber of the box wood render it peculiarly suitable for wood engraving, and it will be difficult to find a satisfactory substitute.

The Desilverization of Lead by Electrolysis.

The following is the discussion on the above paper, which we published last week:

Discussion.

C. Henry Roney, Philadelphia, Pa.: I would like to propound to Mr. Keith at least one or two inquiries. These are: Whether he finds there is any perceptible leakage of the residus through the cotton or muslin bags into the bottom of the vat; whether any of that residue is carried over mechanically in pumping up his liquid to the over-head system in order to keep up a constant circulation (for I suppose he means to convey solution of the same density); and, further, whether in the leakage of the vat, of which he speaks, any loss of electrical energy is transmitted to the earth.

Mr. Keith: The question of the mixing of the residues by passing through the bag has been thoroughly discussed, canvassed, and worked out, and we find that practically there is none. If those plates with their bags over them had to be handled in any manner, there would be some of the residue forced through the bags, but they are not handled; they are simply moved around through the solution, and we find no wash of any kind. What is rather remarkable is that the residues remain upon the plate until it is completely dissolved. By carefully removing the bag (cutting it so as not to drag it off) when the plate has been reduced really to the thinness of fine writing paper, it still apparently retains its original thickness and almost its original external appearance; but when touched, the linger (or whatever it is that applies the touch) sinks into it. This black, pasty-like material can be easily drawn off, so that the lead will remain underneath without any other coating. The motion of these anodes is through the solution, and they have no handling. The movement of the solution does not carry anything over the top of the bag, because the bag is drawn somewhat higher than its top. It comes just above the edge of the solution.

There is one additional point which I have omitted to state, having reference to

The Collection of the Lead.

There are scrapers which hang from the frames down between the cathodes; and when the anodes are moved around in the vat, these scrapers scrape off the lead-crystal deposit, and this deposit drops into the bottom of the vat. When cleaning up time comes, we withdraw the solution by means of a syphon over the top, and at the same time lift out the anodes. The cathodes are then lifted out, and, after that, we get into the bottom and shovel out the deposit of lead. This lot of crystalline lead remains, while under the solution, in a perfectly metallic form, utterly unaffected by oxidation or any other apparent action for an indefinite length of time. Some of it now in my possession has been kept in a bottle, under the solution, for a period of over six years and is as bright to-day as it was at the beginning. This demonstrates that there is no chemical action going on in the solution which would affect the lead.

With reference to the other question, as to a leakage of current, I would say that we found on an electrical test at the commencement, before the vats were filled with liquid, that there was practically no leakage of current with the electro-motive force which was used. Since that time there has been a slight leakage, but none of any account.

The amount of horse power which is consumed in the separation of this material is, we may say, merely nominal. The difference of potential at the binding-posts or electrodes of the vats is scarcely one-quarter of a volt. The current passing through is 1,000 amperes. This one-fourth of a volt and these 1,000 amperes are produced at less than a quarter of one horse power. The main consumption of energy is in overcoming the resistance of the conductors between the source of electricity and the vats themselves, and the conductors between the vats. For instance, the longest single piece of conductor is 28 feet of one and one-eighth inches round copper between the dynamo and the first vat; and my measurements show that one-third of the energy which is passed into this circuit is consumed in that particular copper conductor. So small is the electrical resistance to this conductor that in the ordinary electrical measurements such as prevailed two or three years ago it would have been set down as nothing; but it should be recollected that while in those days we were accustomed to deal with 1,000,000 ohms of resistance, we may now be obliged, in some electrical measurements, to treat of the millionth part of an ohm of resistance, and of all amounts of resistance approaching thereto.

R. W. Raymond, New York city: The merits of this process, as concerns the purity of the lead produced, are, of course, unquestioned and unquestionable.

The Drawbacks of the Process,

Economically, appear to fall under two heads, namely: First, the slowness with which it proceeds; thus causing an accumulation at one time of a large quantity of valuable material in the works, which in turn requires the constant use of a very large floating capital, where this material is high-grade bullion; the number of tons in the works at any one time representing a sum averaging probably $200 per ton, in gold and silver values alone, to say nothing of the

(*Concluded on page 159.*)

MECHANICAL PROGRESS.

Hidden Flaws in Metals.

What is really needed, says the London *Builder*, is some system, could such be devised, by which those hidden flaws which the very best metal made by the very best processes will sometimes contain, should be rendered patent to the eys of an inspector. Is there any chance of such a system being devised? It is clear that chemical tests are quite useless; they can tell nothing but the general composition of the metal. Electric tests may possibly yet be used with effect. They were proposed some years ago, and have been revived lately by Prof. Hughes, the inventor of the microphone. With this beautiful instrument, the "magnetic balance," he has proved that in wires or small pieces of iron, all peculiarities of the metal, including the existence of flaws, can be detected with ease and certainty. His invention has been freely given to the world, but heretofore the world (as usual) has been wholly indifferent to the gift. So far as we are aware, no railway or marine engineer has taken any steps with a view to ascertain whether a similar system might not be applied to pieces of large size, such as those required in actual work. Failing this, mechanical tests in a proper testing machine does not seem impossible. If the axle which broke at Pennistone, before having been set to work, had been subjected to a sudden cross-breaking strain, similar to that which caused its destruction, but very much below what it should be able to support with safety, we cannot doubt that the resulting deflection or bending would have been far greater than if the axle had been sound. What we would suggest, therefore, is that all crank axles, or other pieces of metal called to fill equally important positions should be tested by strains similar to those brought upon them by actual work, and that their deflections under those strains should be recorded. A few experiments would be sufficient to show clearly how great this deflection should be in the case of a sound and perfect axle; and if any specimen showed a deflection decidedly higher than the limit, it should be rejected as a doubtful quality. The expense of such a system would not be great when it once became a regular part of the manufacture of an axle; and it appears to us the only method by which a single faulty specimen can be weeded out of a batch of sound and satisfactory articles.

LUBRICATION TESTS.—Prof. Thurston has recently made several tests with the best sperm oil and graphite at the Stevens Institute, in New Jersey, with all the results in favor of graphite. Each test was stopped the moment the bearing "squealed." Eleven minutes used up the sperm oil, while the graphite lasted 38 minutes. The bearings lubricated with the best sperm oil cut; those with dry graphite or graphite oil did not. The tests were on close bearings, and very high pressure. One-third the quantity of dry graphite did nearly three times the lubricating of the best sperm oil. Long after the sperm oil was exhausted (it squeaked at 11 minutes), the graphite oil continued to lubricate without a cut. The average coefficient of friction was on oil .0555, on foliated graphite mixed with enough of water to distribute it over the bearings, was .0596, and on Dixon's graphite cylinder oil, .0936. Mixtures and quack nostrums are sold with high-sounding names, but the plumbago in them is all they contain of the least value, and it is much better to use it pure.

PROGRESS OF INVENTION.—A prominent engineer is reported by the New York *Tribune* as saying: "Scientific invention runs in grooves. Electricity has unquestionably been the great development of the past 20 years. While nothing is impossible, I think the limit of electrical invention has been reached. Applications of the inventions already made are engrossing attention. In that direction the great problem is power. It is a singular fact that since the discovery of steam and its application as a motive power, there has been no great invention in steam. Now that inventors are applying themselves to extending the electrical inventions, they find cheaper motors necessary. You will see that inventive genius will improve steam making by revolutions as wonderful as any that have taken place in other branches of scientific investigation. What discoveries will be made I cannot predict, but I believe the next step in scientific progress will be in that direction.

IMPORTANCE OF CLOSE OBSERVATION BY MACHINISTS.—Owing to the great demand for rapid workmen, it behooves the coming machinist to scrutinize the minutest details in all mechanical operations, in fact, substantial success depends upon this. The most careful and intelligent workmen are at times stranded, apparently upon the most insignificant trifles. Every mechanical operation is attended with its peculiarities, and I think the exchange of ideas by machinists will help to overcome the small difficulties that often cause much trouble, and which, unless vanquished, detract from a machinist's value.—*American Machinist.*

AN IRON UNIT.—If a bar of ordinary forged iron be planed up to measure one inch square, and the bar be one English yard long, it will weigh 10 pounds, and the tenth of such a bar will weigh one pound more accurately than will the ordinary liter of water weigh one kilo. The English engineer, in these days of iron, knows when he uses shapes of iron, rolled of uniform section, that the tenth of their weight in pounds per yard gives him the area of the section, and this one admirable incident will long fix the desirability of the present unit of England and America.—*Coleman Sellers.*

EFFECTS OF LONG CONTINUED HEAT.—The changes which thermometers undergo when heated for a long time have received the attention of the French Academy of Sciences. It appears from investigations made in this line that in manufactories of printers' ink, where oils are heated to a temperature of some 536° F. for many days, the most accurate thermometers often become so changed as to indicate errors of ten or more degrees. Similar changes of much lower temperatures are also mentioned. Thus the aerometers which are employed in sugar refineries where the molasses is treated by osmosis are plunged for many days in liquids which are heated to 203° F.; and although the temperature is below the boiling point of water it is found sufficient to completely modify the aerometers and to soften the glass enough to render them untrustworthy.

SQUARE HOLE AUGERS are now coming into extensive use. A company has recently been organized in Cleveland, Ohio, for their manufacture and the *Herald* of that city, thus describes the machine: The auger bores a 2" square hole, the size used in ordinary frame buildings and barns, but it can be made on the same principle to bore square holes of any size. Its application is ordinary and works on the same principle as round hole augers. Its end, instead of having a screw or bit, has a cam motion which oscillates a cutter mounted on a steel rocking knife which cuts on both sides. In order to prevent the splintering of the wood, the ends of the cutter are provided with small semi-circular shaped saws which help in cutting out perfectly square corners.

COLORING BRASS.—On brass, a technical journal says, a steel color is developed by using a boiling solution of arsenic chloride, while a careful application of a concentrated solution of sodium sulphide causes a blue coloration. Black being generally used for optical instruments, is obtained from a solution of platinum chloride to which tin nitrate has been added. In Japan the brass is bronzed by using a boiling solution of copper sulphate, alum and verdigris.

ROLLING STEEL.—A manufacturing engineer writes to *La Metallurgie*, Paris, claiming that the success of rolling steel rails depends upon the temperature at which the steel is rolled. He states in this connection, and from his own experience, that bars which were finished at a bright red heat—which were recognizable after cooling by their blue tint—were more fragile under tests by striking or flexion than those finished at a low temperature.

THE LARGEST IRON BLAST FURNACE.—Robert H. Coleman, the millionaire owner of the famous Cornwall iron hills, near Lebanon, Penn., has ordered plans to be prepared for the largest and most complete iron blast furnace in the United States. It is to have a capacity of 1000 tons per week, and is to be known as the No. 3 Colebrook Furnace, and will adjoin No. 2 Colebrook Furnace on the west.

THE LARGEST STEAM HAMMER in the United States has recently been placed in the works of the Cleveland (Ohio) City Forge and Iron Company. Its weight is about 20 tons; with that of the anvil and appendages, 340 tons. Its hight is 38 feet, and the diameter of the cylinder is 38 inches. It was made by the T. B. Miles Machine Tool Works, Philadelphia, and cost between $50,000 and $60,000.

CAST iron, if heated for several days to a temperature of from 900 to 1,000 deg. Cent., neither melts nor softens, but is converted into malleable iron. Its surfaces is covered with a grayish efflorescencs. Its fracture is sometimes of a uniform black, like that of a lead pencil, and sometimes riddled with large black points which are regularly distributed in the metallic paste.

SAND PAPERING MACHINES are said to be the greatest labor saving and most profitable that can be used in any wood-working factory, especially by furniture, bracket and chair companies. They will save from three to ten men's wages, and do the work in a far superior and more perfect manner. These machines are fast coming into use in Eastern shops.

A LARGE FORGING.—The Miller Forge Company of Pittsburg, Penn., has recently forged a large piece of iron of the following dimensions: Length, 6 ft.; cross section, 16½ by 48 inches. It is not every forge that can handle a piece of iron 4 ft. by 1ft. 4½ inches and 6 ft. long.

THE FIRST STEAM ENGINE was brought to this continent from England in the year 1753. Twenty-three years later—in 1776—the number of steam engines in the United States was but three.

A NEW IRON WORKS COMPANY has been incorporated at Portland, Oregon.

SCIENTIFIC PROGRESS.

California Rain Storms.

Much attention has been given, since the establishment of signal service stations here, to a study of the origin and course of Pacific Coast rain storms. Although the stations have been fewer than desirable, still much information has been gained, and it is expected that more accurate data will be acquired after the new stations promised shall have been established at Owen's Lake, San Luis Obispo, and several other localities not yet fully determined upon. There are now twelve stations in operation.

Lieutenant Robert Craig, of the Fourth Artillery, has recently been detailed by the Signal Service Bureau to establish a department of the service in this city. The lieutenant is the senior officer in the meteorological service of the Government, and has devoted a portion of his study to the laws of storms on the Pacific Coast.

In a recent interview with a reporter of the *Call*, the lieutenant remarked that he regarded the Pacific Coast

A Very Interesting Meteorological Area,

and trusted that the service to mariners here will soon be as beneficial to them as it now is to those on the Atlantic seaboard. Continuing his remarks, he said:

"But that is hardly probable, for the reason that the storms on this continent almost invariably travel from the west to the east, so that the Signal Service Bureau has the vast area of territory west of the Atlantic shore line to observe for the purpose of ascertaining the movements of the air currents. For instance, if a storm strikes Washington Territory and blows eastward, we are able to warn ship-owners in New York a day or more before it reaches the Atlantic States. The office on this coast becomes, therefore, a very important adjunct to the bureau, because it learns first of the approach of the storms. Although the establishment of an office here will perhaps be of great er direct importance and benefit to the East than the West, yet it will render very valuable information to mariners here. The office that I shall open in a few weeks will be connected with the twelve observing stations already established on the coast line, and also with the stations at Spokane Falls, Boise City, Winnemucca and Yuma. In addition to reports from these places, I hope to promote the habit among shipmasters of taking observations at sea and reporting them to the office. In this way I shall be able to make up a chart showing the track of storms on the water as well as upon the land."

"Have your observations been extensive enough to enable you to give the general trend of the storms on this coast?" asked the reporter.

The Course of Storms.

"Yes, and I might say now that there is a very erroneous opinion among Californians in regard to the quarter of the compass from which the rainstorms come. I found that it is the popular opinion in the State that the rain usually comes out of the south. That is a mistake, just as the old belief, which was corrected by the progress of astronomy, that the sun revolved around the earth, instead of the earth revolving around the sun. Nearly all the storms in this State, both of wind and rain, come from the north. Only very seldom does a rain come out of the south. The farmers and horticulturists here look to the southern sky and watch for that balmy, humid breeze which experience has taught them almost invariably precedes a rainstorm. While their faces are turned to the south to see the storm approach, the rain comes up behind them."

"But the wind usually blows from the south when it rains."

"Yes, that is true, but that is not the wind that brings the rain. The area of a rainstorm varies in shape from an ecliptic to a circle, with a diameter varying from one hundred to several hundred miles; sometimes it is much less. In that area the wind blows from east to west on a path that approaches the center like the thread of a coiled spring. There is, then, that storm area with its own interior currents. Now as that whole area moves southward the neighboring atmosphere is sucked into the interior currents of the area; so that while the storm area is coming south it draws the air from the south to it, which forms the wind from the south that the farmers observe just before a rain. The southern wind is really drawn into the powerful currents that travel around the center of the storm area, and finally goes up in a whirlwind and is lost in the upper strata of the atmosphere."

"What is the course of the storms that come in from the Pacific?"

Storms from the North.

"Most frequently the storm touches the northern shore of Washington Territory and travels over the southern part of that country, or passes into British Columbia, or goes southeast across Idaho and Montana. Less frequently the storm blows across the southern part of Washington Territory, over Oregon to Utah. Occasionally the storm strikes Oregon, and comes south, travelling down California to Arizona and over to Texas. A storm center very rarely comes from the Pacific directly through the Golden Gate, and it is still rarer that a storm blows out of the south. I remember of tracing a big storm three years ago that took this course: it touched the land at the northwestern shore of Washington Territory, went south across Oregon, down through the Sacramento and San Joaquin valleys, over Arizona, New Mexico and Texas, and then turned northeastward, passing across the Southern and Middle States, spending itself in the St. Lawrence basin. That was a long track, yet I followed the storm's course as easily as one can follow the flight of a bird with the eye."

Value of the Signal Service.

"Has the Signal Service Bureau ever estimated the value of the meteorological observations and warnings to the shipping interests?"

"That is a very difficult question to answer. We are constantly receiving resolutions of thanks from the boards of trade and chambers of commerce, and communications from private individuals, for valuable advice and timely warnings, but the bureau has never been able to calculate, in dollars and cents, the exact value of its predictions. On one occasion, just before two violent hurricanes burst over the Atlantic we gave warning and succeeded in detaining about $10,000,000 worth of shipping in the harbors till the fury of the tempest was broken. That shipping would all have been in the hurricanes if our warnings had not been heeded; but of course it is impossible to say whether any of it would have been destroyed, although it is very probable that it would. To answer your question directly, I will say that no estimate of the value of the service has ever been made."

THE LATE SPANISH EARTHQUAKE.—A scientific commission has been appointed and sent out by the Government at Madrid to visit the scene of the late Spanish Earthquake. This commission has already sent in several reports in the interest of science. One of the most remarkable phenomomen noted by the commission is that of the complete obliteration of the high road leading to Periana, no certain trace of which can be found for several miles outside of the town. The road, in most places, lay between abutting hills, and in the recent terrific disturbances of the earth's crust, it seems to have been forced downward or engulfed. Many of the hills themselves were levelled beyond recognition, and well-known landmarks, whose positions had remained undisturbed for centuries, were moved a distance of 30 yards.

ANTIQUITY OF MAN.—Evidence seems to be fast accumulating that man has existed a much longer time on earth than was ever dreamed of by scientists half a century ago. Man, according to Mr. J. W. Knowles, must have taken up his residence in Ireland at a very early stage in the history of the world. Mr. Knowles has discovered flints at Lane and other places on the northeast coast of that country, some of which he believes show evident traces of human workmanship. One large chipped implement was found in what appeared to be true undisturbed bowlder clay. There are other tools which Mr. Knowles has in his possession which seem to indicate that man has lived in Ireland long before the paleolithic period, during, in fact, the glacial epoch.

TAKING TELEGRAPHIC REPORTS WITH A TYPE-WRITER.—According to a statement in the Nashville *American*, there are only two telegraph operators in the United States who can successfully use a type-writer in receiving the hulky reports of the Associated Press. One of these operators is in Nashville, the other in Elmira, N. Y. But if these men can take reports with a type-writer, of course others can learn to do it, and it is said that many other operators are considering the subject of fitting themselves with machines and learning to use them. It would certainly be a great advantage to telegraph editors and compositors.

CAUSE OF THE SETTLING OF THE PHILADELPHIA CITY HALL.—Philadelphia has a sensation over the reported settling of her immense new City Hall, now in process of erection. It is said that the weight of the hugs towers of masonry is crushing the stone underneath, and that great splits are visible in the walls in many places. Some of these unfortunate results are due to hasty and imperfect bricklaying, and a gang of workmen has been employed to cut out this insecure part and relay the structure in a substantial manner.

REDUCING ANIMAL TEMPERATURE.—Professor Preyer, of the Jena Natural History Society, has been experimenting with Guinea pigs as to the best method of reducing the temperature in animals. Employing a finely divided spray of water of the temperature of 45 degrees F., he reduced the heat of a pig 2 degrees in five minutes. With spray at 70 degrees it took 20 minutes to work the same result. He suggests that the method might be applied to fever paroxysms with success by physicians.

AN ELECTRICAL BATTERY WORKED BY SUNLIGHT.—It is said that a German electrician has invented a battery which will do wonders if its plans could only be carried out. The electric battery is to be worked by sunlight mostly, if not entirely, and the cost of the other elements could be reduced to a minimum. If cheap and portable accumulators could be made for storing the electricity the sunlight of a single summer could be made to store up force enough to drive all the mills and railroads for years.

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Passing Events.

The nation has this week experienced a change in the head of the government, President Cleveland having been inaugurated with suitable ceremony on the 4th inst.

This week also closes the session of the California legislature, which has, by the way, not done nearly as much practical work as was expected of it.

There is still trouble among some of the iron workers at our largest foundry, where the helpers had their pay reduced from $2 to $1.75 per day. The matter has not yet been settled.

Up at Eureka, Nevada, some of the largest works have been closed down, and it is not known when they will be started up again.

We note from our interior exchanges that prospectors are beginning to range the mountains once more in search of quartz.

There is still considerable excitement about New River mines, and it is likely there will be quite a rush there shortly. Many men have already gone. Those who do go ought to provide themselves with means of returning in case of disappointment, for everybody is not likely to strike a rich claim.

MR. B. B. THAYER, an old pioneer chemist and druggist, and for many years manager of the Guadalupe Quicksilver mine, near San Jose, died at the mine on Tuesday.

WE received at this city 89,303 tons of coal in February and March.

Let the World Make a Note of It.

It may be well for people abroad to understand what is so well understood here, that we are on the eve of a new gold era in California. We speak advisedly; we are not writing at random; but have the data at hand to warrant what we say. There is likely to arise here, and even exists at present, such a condition of affairs as must soon impart renewed vigor to, and insure for the business of gold mining a long and prosperous life in this State. The facts on which we found this opinion are indisputable—are so tangible and certain that they may safely be adopted as the basis of any, even the most extended enterprise connected with this branch of mining. We do not say, for we do not believe, there is going to occur in California any great excitement or so called "boom" in connection with gold mining, either placer or quartz. Of this sort of thing we have had too much already, and it is gratifying to think that its day is well nigh over. As our miners have got done with stampedes and rushes, so have investors got done with premature expenditures and wasteful speculations, and when we speak of increased activity in mining we only mean that our people, finding that the business rightly conducted can be made to pay, are for that reason engaging in it more largely than ever before. If mention is made of a new and promising mineral district, it is not meant that men can repair to such district and there make money without the exercise of ordinary business sense; but only that there exist there latent opportunities, which, to be made available, require the intelligent application of labor and capital. When the *Rural Press*, our confrere in the agricultural world, describes the orange and lemon orchards of Los Angeles it does not mean that nature has produced either, only that the soil and the climate of that region, being so extremely favorable to the growth of these citrus fruits, has induced man to come in and here plant the same extensively. So of our mineral resources; nature has placed them in the mountains under conditions that greatly tend to encourage their development. Still, man must come in and do his part, the same as in the growing of fruit or grain.

At one time the agricultural resources of California were thought to be of a very low order. Now they are known to surpass those of any other part of the world. A few years since gold mining in this State, having been long on the wane, was supposed to be nearing its end. To-day it looks differently—looks as if the business were about to take a new lease of life. Gains pervade every department of this industry. We have gained in the matter of economizing labor and expenditures, in the extraction and working of the ores, and in the finding of new and the more thorough exploration of old deposits, the latter amounting often to a rediscovery, in that, the extent and value of these deposits have greatly exceeded all previous expectation. Grounds traversed by trails for thirty-five years, and which during all this time attracted little or no attention, are now found to be rich in gold-bearing quartz lodes or other form of auriferous deposit. The hydraulic banks along the Klamath, worked for many years and generally in a small way, turn out to be in themselves a great gold field, from which millions might annually be taken out without working them in an exhaustive way. The gold beaches and bluffs along our sea-coast, nearly abandoned for years, are likely to become very soon once more the theater of active operations, while the tailings that have accumulated in such quantities along the interior river channels seem destined also to be moved and rewashed with profit.

Looking up and down the principal mineral belt of the State, we find new mining centers springing up at different points along it. At its end a silver producing region has sprung into existence during the past three years which is turning out that metal at the rate of $5,000,000 per annum, with a prospect of doubling this production in the early future. Centrally on this belt is situated the Washington district, revealing an astonishing wealth of auriferous quartz, while at its northerly end we find the New River country, still more extensive and equally rich in this class of deposits. That both of these localities are to meet with early and energetic development admits of no doubt, the former, aside from its other attractions, being recommended on account of its extreme accessibility. New River, though not so easy of approach just now, will soon be rendered almost equally accessible, a wagon road having been projected from Humboldt bay to the mines. The route of this road is now being surveyed by a company organized for the purpose of building it. The work of its construction has been committed to James H. Crossman, formerly of this city, now a resident of Eureka, Humboldt county, and largely interested in these New River mines. Crossman being notoriously a man of energy and push, it may be expected that this road will meet with early and successful construction.

A road is also to be built into that region, it appears, from Etna, the principal town in Scott's Valley. This road is not designed for the transportation of machinery or merchandise, but for the shipment to New River of farming produce, fruits, etc., Scott's Valley being one of the finest agricultural districts in the State. With the principal staples of subsistence supplied at reasonable rates, as they no doubt will be by means of these wagon roads, the cost of living at these New River mines cannot be very great. So far general attention seems to be turned strongly to this, the latest discovered gold field.

Gas Coals.

We have no coal in California which is fit to make gas, and in fact what coals we have here are very poor. The coal used by the gas companies is all imported. Coal for gas should contain but a small proportion of sulphur compounds, as it is then easily purified, requiring less lime, producing a better quality of gas, and the coal may be safely stored without danger of spontaneous combustion.

Good gas coal should not require more than one bushel of lime to purify 5,000 or 6,000 feet of gas. The sulphur in coal is sometimes in combination with iron; in other cases it passes off in a volatile state, leaving but little in the coke. For gas making this latter is a disadvantage, as the less sulphur entering the gases the better, since it must be removed by purification. For the blast furnace, on the contrary, the less sulphur remaining in the coke the better, since it is the sulphur in the coke which is injurious, and not that in the hydrocarbons, which passes off at the top of the furnace stack. In some cases, however, when the gas carries with it most of the sulphur, the gas may be so superior in illuminating power as to warrant its use, notwithstanding its increased cost of purification.

A ton of good coal used in the making of gas should produce 35 to 40 bushels of coke, weighing 35 pounds to the bushel. The coke is used for heating the retorts. Should there be a surplus of coke where a large amount of gas is made, this is a valuable merchantable product, especially in a place like this where coal for domestic purposes is comparatively expensive.

The Iron Workers.

Although most of the men at the foundries have gone back to work at the old wages, there is little doing in the shops and none of them are working full-handed. The proprietors maintain that it will be impracticable to continue for any length of time at ruling rates of wages, while the mechanics are as firm in the belief that no reduction should be made. At one of the largest works the helpers have been notified of a reduction of 25 cents a day in their wages, and the men at once quit work. Meetings of sympathy have been held by some of the labor associations. On Wednesday the moulders at the Union Works quit in a body and went out to join the helpers. On the same evening the moulders and helpers from the various shops held a meeting, and the committee appointed to confer with Mr. Scott made their report, that he had said that he would employ a certain number at the old rates, but reserved the right of employing others at whatever wages he chose.

Mr. Scott is quoted as having told the committee that the trouble had been caused by a misunderstanding. The order issued was intended to affect only new men, who were to be employed at a 15 per cent reduction, beginning March 1st, while the old hands would continue to receive $2.

The differences are not yet settled, as will be seen from these statements.

Heating Feed Water for Steam Boilers

While many engineers know that there is a saving of fuel by heating the feed water for steam boilers, perhaps not a great proportion know just how much gain there is in heating feed water a certain number of degrees; for instance, in one boiler the feed water may be heated to 120 degrees, and in another boiler it may be heated to 180 degrees, and it is often times desirable for an engineer to know how much coal would be saved by giving the additional heat of 60 degrees, from 120 to 180, or in another case, the water fed into a boiler may not be heated at all by a heater, and its temperature is, say 60 degrees; but it is desired to know how much saving of fuel there would be if the water could be heated to 160 degrees. There are simple rules by which the degree of saving may be found, and we will explain the method of doing this, and also give a table which will be useful to the engineer and save him the trouble of even making the simple calculation necessary. We find, by looking at tables which contain the "Properties of Steam," that the total heat in steam varies with the pressure, and that in steam of atmospheric pressure the number of units of heat is 1178.6. At 50 pounds pressure there are 1205 units of heat; at 100 pounds pressure, 1216.9 units; at 150 pounds pressure, 1225.4 units, and at 200 pounds pressure, 1230 units.

When we want to find how much work a pound of coal is doing in evaporating water under pressure, we must know what that pressure is so that we may know how many units of heat go into each pound of water. For instance, in steam at atmospheric pressure there are 1178.6 units of heat in each pound, and in steam of 200 pounds pressure there are 1230, or 51.4 more units than in steam of atmospheric pressure, which is 4 3 per cent more heat necessary to evaporate a pound of steam under 200 pounds pressure than if under only atmospheric pressure.

Now suppose we have a boiler which has the water pumped into it without being heated at all—say 60 degrees of temperature, and suppose that the boiler is worked under 120 pounds pressure, and that under these conditions one pound of coal evaporates seven pounds of water. We want to know how much more water would be evaporated by each pound of coal if the water could be heated up to 180 degrees. We first must know how many units of heat there are in each pound of steam of 120 pounds pressure. We find by looking at tables of the "Properties of Steam" in any engineer's pocket-book that there are 1220.6 units, and as the feed water goes into the boiler at 60 degrees, the coal has to give out 1220.6—60=1160.6 degrees of heat to each pound of water evaporated—but each pound of coal evaporates seven pounds of water, consequently seven times 1160.6 is 8124.2, which are the total units of heat given out to the water by each pound of coal; now if we can by a heater add 120 degrees of heat to each pound of water, raising it from 60 to 180 degrees, that will be for seven pounds, seven times 120=840 units of heat, and this 840 added to 8124.2 is 8964.2, which is given out by the heater and the one pound of coal. We have seen that in one pound of steam of 120 pounds pressure there are 1220.6 less 60=1160.6 units of heat to be imparted. Now divide 8964.2 by 1160.6 and we have 7.72 pounds of water which will be evaporated by one pound of coal when the feed water is heated to 180 degrees and only seven pounds of the water goes into the boiler at 60 degrees—that is a gain of over 10 per cent in the quantity of water that would be evaporated per pound of coal.

If we could use the steam at atmospheric pressure and heat the water to 212 degrees, we would have a still further saving, as in this case only 966.6 units of heat would have to be given off to each pound of water, and as 8124.2 units of heat are given off by one pound of coal, this divided by 966.6 would give 8.4 pounds of water evaporated at atmospheric pressure. It is now customary to rate the economy or efficiency of boilers by comparing them with some standard condition, and the condition which has been adopted is that of having the feed water heated to 212 degrees, the pressure to be that of the atmosphere, only; and in constructing the table, the number of units of heat which have to be supplied by the coal under this condition will be 966.6, as before stated.

Every pound of pressure which is added increases the number of units of heat to be furnished, and also every degree of temperature which the feed water is reduced, from and below 212, requires an additional unit of heat to be furnished by the coal. If we take this 966.6 units for a standard and let it represent one, then each pound of pressure added will add to it, and so will each degree of temperature taken from the feed water. By looking in any column under the pressure of steam which is carried by the boiler, and in this column, in line, with the temperature at which the water is fed into the boiler, will be found a number which represents the increased quantity of coal necessary to evaporate water above what would be required if the fuel was 212 and the steam at 0, or atmospheric pressure.

Thus suppose we are carrying 100 pounds of steam and the feed water is going into the boiler at 70 degrees temperature; in the column under 100 and opposite 70 we find 1.185, and supposing that we are evaporating seven pounds of water per pound of coal, by multiplying 7 by 1.185 we get 8.295 which is the number of pounds of water that would be evaporated per pound of coal if the standard conditions were obtained; and so with any other boiler or conditions of boiler pressure and temperature of feed water.

We can also make comparisons between two boilers; thus, let one boiler carry 50 pounds pressure, and have the feed water heated to 100 degrees, and let another boiler have a pressure of 100 pounds and feed at 50 degrees. Look under 50 and opposite 100; we find 1.142. Now, look under 100 and opposite 50 and we find 1.206. If each boiler evaporates 7 pounds of water per pound of coal, we find by multiplying each by 7, thus, 7x1.142 7.994 pounds of water would be evaporated by the first boiler under the standard pressure and feed, and 7x1.206 8.442 pounds of water would be evaporated by the second boiler if put under the same conditions, so that the second boiler is the best. If the second boiler only evaporated 6 pounds of water per pound of coal, then 6x1.206 7.236 pounds which it would evaporate under the standard conditions. The comparisons of any boilers working under other pressures and temperature of feed, may be made in the same way.

This table is made by taking the units of heat in a pound of steam at any pressure, and, deducting the temperature at which the water is fed into the boiler, dividing the remainder by 966.6.

Temp. of Feed Water.	BOILER PRESSURE ABOVE THE ATMOSPHERE.																										
	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260
212	1.000	1.008	1.014	1.019	1.023	1.026	1.029	1.032	1.035	1.037	1.039	1.041	1.043	1.045	1.047	1.048	1.050	1.051	1.053	1.054	1.055	1.057	1.058	1.059	1.060	1.061	1.062
210	1.002	1.010	1.016	1.021	1.025	1.028	1.031	1.034	1.037	1.039	1.041	1.043	1.045	1.047	1.049	1.050	1.052	1.053	1.055	1.056	1.057	1.059	1.060	1.061	1.062	1.063	1.064
205	1.007	1.015	1.021	1.026	1.030	1.033	1.036	1.039	1.042	1.044	1.046	1.048	1.050	1.052	1.054	1.055	1.057	1.058	1.060	1.061	1.062	1.064	1.065	1.066	1.067	1.068	1.069
200	1.012	1.020	1.026	1.031	1.035	1.038	1.041	1.044	1.047	1.049	1.051	1.053	1.055	1.057	1.059	1.060	1.062	1.063	1.065	1.066	1.067	1.069	1.070	1.071	1.072	1.073	1.074
195	1.017	1.025	1.031	1.036	1.040	1.043	1.046	1.049	1.052	1.054	1.056	1.058	1.060	1.062	1.064	1.065	1.067	1.068	1.070	1.071	1.072	1.074	1.075	1.076	1.077	1.078	1.079
190	1.022	1.030	1.036	1.041	1.045	1.048	1.051	1.054	1.057	1.059	1.061	1.063	1.065	1.067	1.069	1.070	1.072	1.073	1.075	1.076	1.077	1.079	1.080	1.081	1.082	1.083	1.084
180	1.032	1.040	1.046	1.051	1.055	1.058	1.061	1.064	1.067	1.069	1.071	1.073	1.075	1.077	1.079	1.080	1.082	1.083	1.085	1.086	1.087	1.089	1.090	1.091	1.092	1.093	1.094
170	1.042	1.050	1.056	1.061	1.065	1.068	1.071	1.074	1.077	1.079	1.081	1.083	1.085	1.087	1.089	1.090	1.092	1.093	1.095	1.096	1.097	1.099	1.100	1.101	1.102	1.103	1.104
160	1.052	1.060	1.066	1.071	1.075	1.078	1.081	1.084	1.087	1.089	1.091	1.093	1.095	1.097	1.099	1.100	1.102	1.103	1.105	1.106	1.107	1.109	1.110	1.111	1.112	1.113	1.114
150	1.063	1.073	1.078	1.083	1.087	1.091	1.094	1.097	1.100	1.102	1.104	1.106	1.108	1.110	1.112	1.113	1.115	1.116	1.118	1.119	1.120	1.122	1.123	1.124	1.125	1.126	1.127
140	1.074	1.083	1.088	1.093	1.097	1.101	1.104	1.107	1.110	1.112	1.114	1.116	1.118	1.120	1.122	1.123	1.125	1.126	1.128	1.129	1.130	1.132	1.133	1.134	1.135	1.136	1.137
130	1.085	1.093	1.098	1.103	1.107	1.111	1.114	1.117	1.120	1.122	1.124	1.126	1.128	1.130	1.132	1.133	1.135	1.136	1.138	1.139	1.140	1.142	1.143	1.144	1.145	1.146	1.147
120	1.095	1.104	1.109	1.114	1.118	1.122	1.125	1.128	1.131	1.133	1.135	1.137	1.139	1.141	1.143	1.144	1.146	1.147	1.149	1.150	1.151	1.153	1.154	1.155	1.156	1.157	1.158
110	1.105	1.114	1.120	1.124	1.128	1.132	1.135	1.138	1.140	1.142	1.144	1.147	1.149	1.151	1.153	1.154	1.156	1.157	1.159	1.160	1.161	1.163	1.164	1.165	1.166	1.167	1.168
100	1.115	1.124	1.130	1.135	1.139	1.142	1.145	1.148	1.151	1.153	1.155	1.157	1.159	1.161	1.163	1.164	1.166	1.167	1.169	1.170	1.171	1.173	1.174	1.175	1.176	1.177	1.178
90	1.126	1.135	1.140	1.145	1.149	1.153	1.156	1.159	1.161	1.163	1.165	1.168	1.170	1.172	1.174	1.175	1.177	1.178	1.180	1.181	1.182	1.184	1.185	1.186	1.187	1.188	1.189
80	1.136	1.145	1.151	1.156	1.160	1.163	1.166	1.169	1.172	1.174	1.176	1.178	1.180	1.182	1.184	1.185	1.187	1.188	1.190	1.191	1.192	1.194	1.195	1.196	1.197	1.198	1.199
70	1.147	1.156	1.161	1.166	1.170	1.174	1.177	1.180	1.182	1.184	1.187	1.189	1.191	1.193	1.195	1.196	1.198	1.199	1.201	1.202	1.203	1.205	1.206	1.207	1.208	1.209	1.210
60	1.157	1.166	1.172	1.177	1.181	1.184	1.187	1.190	1.193	1.195	1.197	1.199	1.201	1.203	1.205	1.206	1.208	1.209	1.211	1.212	1.213	1.215	1.216	1.217	1.218	1.219	1.220
50	1.167	1.176	1.182	1.187	1.191	1.194	1.197	1.200	1.203	1.205	1.207	1.209	1.211	1.213	1.215	1.216	1.218	1.219	1.221	1.222	1.223	1.225	1.226	1.227	1.228	1.229	1.230
40	1.178	1.187	1.192	1.197	1.201	1.204	1.207	1.210	1.213	1.215	1.217	1.219	1.221	1.223	1.225	1.226	1.228	1.229	1.231	1.232	1.233	1.235	1.236	1.237	1.238	1.239	1.240

While two miners—H. Forbes and John Barrett—were at work on a claim at Gibsonville, they were washed into the flume and carried a distance of 2000 feet before they managed to get out. Their escape from death is almost miraculous.

A large meeting has been held at Etna, to build a trail to the New River mines. A subscription was started to put men at work, and the miners at New River are also taking similar action to build the trail. A pack train will leave next week with supplies.

The New Judson Drill.

The accompanying engraving represents the new 26-inch drill, made by the Judson Manufacturing Co., of this city.

This pattern is new and extra heavy. The material and workmanship is first-class in every particular.

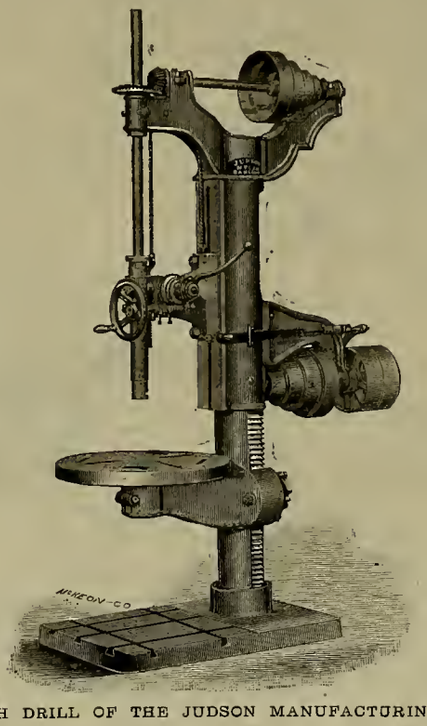
The spindle and head is counter-balanced with chain and wsight, with a vertical adjustment of 20 inches. The spindle is made of hammerod steel, bored out to fit the No. 3 Morse Drill Socket, and has eight inches of travel.

The quick return attachment is very strong, simple, and perfect in its action.

The face-plate swings round the column in any position. Can be raised or lowered 18 inches, and will receive work 32 inches high and 26 inches in diameter. The bed-plate is planed, and will receive work 46 inches high.

The pinion and rack for lowering the table is placed on the side, and revolves with the table. in this position, the dirt and borings falling from the table, cannot get in the rack.

The pulleys on the lower cone shaft are 10 inches in diamster for 3-inch belt, and should run 250 revolutions per minute. There are



NEW 26-INCH DRILL OF THE JUDSON MANUFACTURING COMPANY.

four belt speeds on the cones which are turned suitable for a 2½ inch belt. This machine weighs 1500 pounds and costs $275.

The Judson Company also manufactures a pulley-drilling machine for drilling the set screw holes in pulley nuts without drilling through the outside rim. It can be attached to the drill in one minute, simply by removing the face plate and resting the pulley-drilling attachment in the face plate socket. It weighs 50 pounds and costs $50.

Carbons.

Borts, black diamonds, carbons or carbonados, as the black variety of the diamond is variously called, are used more and more extensively in the arts every year. This substance is employed largely in diamond drills used in mining and for stone sawing machines, etc. It consists of pure carbon excepting from 0.27 to 2.07 per cent. Its specific gravity ranges from 3.012 to 3.416. In size, shape and temper there are very great differences. Pieces from 400 to 700 karats have been found. The supplies used in this country came from the province of Babia, in Brazil. Carbons have also been reported to occur in South Africa, India and Russia, but these occurrences have not been authenticated.

Very frequent discoveries of carbons are reported to have been made in the United States, but the supposed black diamond is commonly found to be titanic iron, easily crushed to dust by a light hammer or by strong pliers.

Traffic over the Brooklyn bridge is rapidly increasing.

Electro Metallurgy.

Mr. N. S. Keith, the writer of the article on the "Desilverization of Lead by Electrolysis," which is published in another column, has lately become a resident of this city, where he is engaged with the Pacific Coast Electrical Construction Company. Mr. Keith was formerly one of the editors of the Electrical *World*, and still writes for that journal. He is now engaged upon the electric lighting plant, etc., at the new Union Iron Works on the Potrero. They will soon have running at these works an electrical railway, the construction of which Mr. Keith is supervising.

He is also engaged in making for a California company a demonstration of the process of electro deposition of copper from solution instead of depositing it by iron as is now done. It is accomplished by electrolysis. This has been done before, and Mr. Keith is simply demonstrating here the practicability of the process. He intends to demonstrate the method of lead refining by electrical action also. The use of electricity in metallurgical processes is rapidly coming to the front. On this coast, however, little has so far been done. The Pacific Coast Electrical Construction Company intend also making mining machinery to be run by electricity, in such places as power can be obtained for the dynamos. Recent improvements admit of the fluid being carried a long distance from sources of supply, and by its means to run mills, pumping machinery, hoisting apparatus, etc. As soon as they are ready they will put up the machinery with a guarantee of its efficiency. There are many places in the mountains where such a plan as this would be of the greatest advantage.

Frank W. Smith, of the Mining and Scientific Press of San Francisco, called at our office on Friday. Mr. Smith will spend a few days taking notes of the progress of Daggett, Calico and the mines, for publication in the able and valuable journal he represents.—*Calico Print, March 1st.*

The Richmond Mining Company at Eureka has closed its furnaces, refinery and mine. This throws about 300 men out of employment. Some 40 miners who have been working on tribute, have also been thrown out of work.

During the month of February the coinage at the San Francisco Mint consisted of 62,000 double eagles and 500,000 standard dollars, or a combined value of $1,740,000 against $1,620,000 for the same month last year.

The contractor for the water works at Golden Gate Park has ordered his material from the East. It seems as if the taxpayers' money might be spent in this city to better advantage than sending it East.

Fresno Mines.

Elsewhere, in this issue, is a sketch of Fresno county's mining interests, from the pen of our representative, Mr Frank W. Smith, now enroute to Arizona and New Mexico. The facts were gathered from reliable sources by our correspondent, and show a deplorable state of affairs to exist in Fresno, as to her greatest and richest industry. Comparatively speaking, the future leading industry of the county is lying dormant and neglected, especially so by her home capital. Facts go to show that money and machinery, only, is necessary to add millions to the county's wealth. Ore, and abundance of it, lies waiting transformation into bullion and coin. Outside capital is stepping in, and ere long, Fresno's great mineral wealth will be in the hands of corporations and capitalists like her lands, which are now owned by colonies and mortgaged to monied institutions. Prosperity and plenty will be the result of the proper development of these mineral fields.

Tailings.

Fresno City is not a mining city.

Careful investment in the mines of the county would pay better than loaning money on long time and low interest.

The resident capitalist of Fresno is overlooking the best paying investments that are open to practical business men of the county, in her rich and undeveloped mines.

When Fresno's mines yield a steady output, money will be plenty and times good.

Development is all that Fresno's mines need to yield thousands.

In April the Mining and Scientific Press representative will visit the mining districts of Fresno county and describe their mines and methods of extracting and treating the output.

Graphite.

Very little mining for graphite is done in this State, though it occurs here in many places. The trouble seems to be that most of our California material is of too low a grade to be profitably mined. The substance is used all over the world for making lead pencils, stove-polish, antifrictional compounds, crucibles, and as a pigment. The Russian and Ceylon product seems to take the lead in quality, and most of that used comes from there. None of very good quality, in any amount, has been found in California. It occurs here among other places, at Gold Springs, Tuolumne county, a mile north of Sonora; near Fort Tejon, Kern county; on the border of Tomales bay; near Summit City, Alpine Co., and at several places in Sonoma, Marin, Plumas and Fresno counties. A late discovery is at Tejunga, 25 miles from Los Angeles and 12 miles from the S. P. R. R. line; another late discovery is at Borer Hill, Fresno county. Works were here established some years since to make crucibles from the California product, but they experienced difficulty in getting a sufficient supply of suitable material.

The Inauguration.

The great event of the week is to be found at the National Capitol. For several days the railways centering in Washington have been put to their utmost to carry the throng going up to witness the inauguration of the new President, Grover Cleveland. It seems that interest in this great national event has been wider and more demonstrative than on any previous inauguration. Preparations to gratify the immense concourse of sight-seers have been commensurately elaborate. Inaugural pageant, inaugural music, inaugural feast and inaugural ball, have all been developed with an expenditure of imagination and of wealth, the like of which the country has never seen before. The wires are resonant with accounts of popular huzzas, stately music and oratory, with the solemn sound of the official oath and the calm declarations of the inaugural address. The day is reported to be beautiful even in the Eastern March—a marked compliment no doubt to the incoming regime.

There are 15 men employed at Cerro Gordo, who are getting out a great deal of ore, all of which is shipped to the Selby Works, San Francisco.

A new mining district has been formed near Bishop Creek. It includes the ground where the recent discoveries were made.

San Joaquin and Sierra Nevada Railway.

We feel a genuine interest in all enterprises which aim to advance regions of the State which are neglected hecause of lack of travel and transportation facilities. The great trunk lines already constructed, open an immense area, it is true, but there is still a greater area which needs local or lateral roads to secure recognition of its real merits, and encourage the development of its resources. The human hody is nourished and restored hy tho great arteries, hut they could not do their work without the capillaries which extend to the uttermost extremities and to the portions lying along the path of the arteries. It is much the same with avenues of travel and transportation. The narrow gauge road comes in as one of the greatest boons of modern engineering for the development and progress of our whole area.

One of the newest enterprises in this line is the San Joaquin and Sierra Nevada Railroad, which is now being pushed vigorously along the path worked out for it. The fine map on this page shows the portion of our State which may properly he called Central California, extending from Monterey and Fresno counties on the south to Mendocino and Butte counties on the north, and from the Pacific Ocean to the Sierras. Just in the center of this region and running almost due east and west may be seen the line of the San Joaquin and Sierra Railway, starting at navigahle water on the Mokelumne river at a new town named Bracks, where the river craft land, and extending eastward through every rich district of San Joaquin county into portions of Calaveras county, and with projected extensious to the Big Trees and to the Yosemite valley.

The western terminal point, Bracks, ahout 15 miles north of Stockton, has first-class terminal facilities. A wharf 500 feet in length reaches out to water 20 feet deep on the Mokelumne, and from this point San Francisco, Sacramento, Stockton, and all other points on the rivers and bays of Central California can be easily reached.

Running eastward the road touches, first, the town of Woodhridge, and then at a distance of 13 miles from Bracks crosses the C. P. R. R. at Lodi, a growing and flourishing town. Here the San Joaquin and Sierra Nevada road connects with the entire railway system of the United States, and thus enjoys the fullest passenger and freight connections. A vast and rich wheat region centers at Lodi, and its productive soil also welcomes many other important productions, such as fruit, hops, melons, etc. The new railway hrings all this produce to deep water, and thus gives the producer the advantage of competing routes for an outlet.

The next town east of Lodi is Lockeford, eight miles distant; then Clements. At this point we reach the lower foothills and hegin to find a change in the soil, though still most excellent in quality and well adapted for vines aud fruit. The road from the station follows up the valley of Bear creek to the towu of Wallace, a distance of six miles, giving at every curve a beautiful glimpse of the Sierras.

From Wallace to Burson, six miles, thcre is an ascent of ahout 300 fect. From here to

Valley Spring,

Distance five miles, which is the present terminus of the road; the ascent is 300 feet, the maximum grade being 116 feet per mile. This is the most romautic and heautiful section of the road as now finished, and it is helieved hy many that the situation of the town of Valley Spring is the most heautiful in the foothill region of the Sierras, and destined to become one of the principal pleasure resorts of the State. The water supply is abundant and excellent, coming from the headwaters of the Mokelumne. The town is well laid out. There are hroad, graded tracts planted with shade trees and with perfect drainage. The location is perfectly sheltered from the north winds. The mildness of the climate and purity of the atmosphere combined with the pleasant surroundings, makes it a favorite resort for pleasure seekers and also for persons suffering from pulmonary complaints.

Valley Spring is reached from San Francisco hy rail in seven hours and a half; from Sacramento in three hours and from Stockton two and a half hours. This, at the present time, is the most desirahle point of departure for the Calaveras grove of big trees, distant 40 miles, hy an excellent road via San Andreas, Altaville and Murphy's, giviug tourists the opportunity of seeing the mining region of Calaveras and of enjoying the grand scenery of the Sierras. Work on the extension of the line from Valley Spring to the Calaveras Big Trees, the proposed eastern terminus, will hegin at an early day.

Calaveras County.

We are glad of an opportunity to call attention to the excellences of Calaveras county, for, though it is a regiou rich in the history of the miniug era of the State, it is too little heard of in the later agricultural period. In another column a correspondent gives some very interesting statements concerning the live stock interests. We regard the county as one of the most promising fields for enterprise and investment and for humble home making. The county has an area of 622,000 acres, of which it is estimated that there are 300,000 acres of U. S. Government land suhject to entry. Here are found some of the hest mines in this State, and the entire county is exceedingly rich in mineral deposits. The baser metals, copper, iron, cinnahar, etc., are found, and ledges of marhle, limestone and granite and undeveloped deposits of coal are known to exist. Several most interesting natural wonders are also to he found here, among which are the world renowned Big Trees; the great cave, with its magnificent chamhers and wonderful stalactites, and the natural hridge also attract the attention and elicit the admiratiou of tourists from all parts of the world. Among its other sources of wealth, Calaveras possesses one of the most valuahle timber belts in the State, live oak, sugar and nut-pine predominating. This county is one of the hest watered sections of the State, and its undeveloped resources are almost inexhaustihle. With the opening which is now made by the new railway, the rapid extensiou of orchard and vineyard and poultry farming, and the huilding up of the indnstries generally of the county, may he expected.

Mr. Henry G. Hanks, State mineralogist of California, made a trip up into Calaveras connty a short time since. In an interview with him last week he stated to a representative of the PRESS that tbe region visited hy him is rich in mineral wealth. He saw some croppings of iron likely to he valuahle near Messenger Valley. There is no mine hut a valuahle prospect. He saw also some fine huilding stone which he helieves will he very valuahle. It is in the same range as that of Mokelumne Hill, and is also near Messenger Valley.

A deposit of chrome iron was also examined, which bids fair to he valuable. Mr. Hanks also saw a hed of lignite which he thinks will he utilized to a large extent. It is, of course, not a high grade coal, hut there is considerahle of it, and it will be of use to that region. It is not developed though a short tunnel has heen run in.

All along the line of this railroad, Mr. Hanks says there is fine clay for hrick making purposes. A good many brick huildings are being put up, and there is an air of enterprise and improvement all along the road. Such roads as this do much to develop the country.

The Campo Seco copper mine is getting out copper and is a good property. It is in a heavy cupriferous belt that here traverses the country. Furnaces were put up here at au early day, and a railroad built connecting them with the mine, which has been opened hy a vertical shaft 275 feet deep, and hy three levels, 80, 140, and 200 feet deep respectively. Mr. C. Berger, Superintendent, says that the vein is well defined in a country of slate; course of vein, northeast and southwest; dip, 62° S. E. In his opinion there is here a large hody of ore that will average ten per cent copper. The hoisting-works are driven hy water communicated hy an ordinary hnrdy wheel at a cost for water of three dollars per day. The ores arc generally chalcopyrite with some hornite and iron pyrites. The reduction works put up here are complete and extensive.

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The Desilverization of Lead by Electrolysis.

(*Continued from page 154.*)

lead, or of all that the extensive plant requires. On the other hand, the declaratina of Mr. Keith that the product of lead is in precise proportion to the number nf amperes, or proportional to the quantity, of current, raises the question at once whether, with a given plant, the rapidity of production may not be increased simply by increasing the quantity of current. If Mr. Keith's works, using a thousand amperes, produce for each vat a ton in ten days, then would it be possible for him, by doubling that quantity of electrical current, to produce double that amount of lead, *i. e.*, treat double the amount of bullion in the same time?

The second objection to this process is also, more or less, an economical one. It is this, that the process furnishes us with pure lead, but it also furnishes us, in the residues, with the worst sort of material for further treatment. I wish to inquire what has been Mr. Keith's experience so far, in the matter of the extraction of gold and silver from the residue. The fact that he gets all the lead, and that he makes it pure or nearly pure, is excellent so far as it goes. Possibly it may be done with such great cheapness and regularity, and so little skilled labor, as to make it compare favorably with the ordinary processes of calcination and desilverization. But, on the other hand, there is the question whether there is loss on the gold or the silver, whether the slag which comes from the crucible in which the nitrate of soda has been used is itself worth anything, and whether we are obliged to follow remnants of gold and silver down through that waste material for further treatment; all of which questions will have to be further considered before we can sum up the advantages or disadvantages which this process, like every other, must possess, and decide upon which side the balance of advantage inclines. I fancy, though I have not had any personal experience of the advantages of the process, that it will turn out, like most other processes of acknowledged merit, to be economical under some conditions and in some localities, whereas in other localities and under other conditions it could not, perhaps, compare economically with the present processes.

Mr. Keith: The impression which I desire to convey is this: That this plant was an experimental one, but

An Experiment Upon a Large Scale.

Every point which we have met has been favorably decided. The question of the separation of the residues to their ultimate constituents has not been fully determined, but the slags which are produced are very fluid ones, and the separation of the gold and silver, as far as our tests have gone, seems to be complete. The chemical separation of antimony has been thoroughly considered, but none yet carried into practical effect. There seems so far to be very little, if anything against it upon theoretical consideration.

As to the economy of plant, considering the amount of material which must be placed under treatment, I will say this, that the process has been carried on at the rate of dissolving these plates in two and half days or sixty hours, and the action was still as effectual as at the slower rate. It may be considered as settled that, with the proper means for the increase of our "quantity," the time could be at least reduced from seven days or one hundred and sixty-eight hours to sixty hours. That decreases the necessary size of the plant for a given output very materially.

It was not thought necessary, in this plant, to go to that extent, but the experiments which have been carried on, and to which no practical objection has been urged by those who are experienced in such matters, settle that point. At the time of the first publication of this process, it was considered hy myself an impracticability to dissolve these plates with a greater rapidity than in about eight days, for this reason: If the solution is not properly circulated, it does not enter the bag and filter through it, so that the sulpbate of lead which is formed within the bag by the electrolytic action can be dissolved by the acetate solution and carried from the bag into contact with the cathode. There would thus be, in the case of an imperfect circulation, a formation of a crust of sulphate of lead, which would not be dissolved, and would interrupt the process. But I am now satisfied that the time can be reduced, as I have said, to sixty hours, without impairing the efficiency of the operation in that way.

Rosewood Trees are found in South America and in the East Indies and neighboring islands. There are half a dozen kinds. The name is not taken from the color of the wood, as is generally supposed, but by reason of a rose-like fragrance which it possesses when first cut. Some of the trees grow so large that planks four feet broad and ten feet in length can be cut from them. These broad planks are principally used to make tops for pianofortes. The rosewood tree is remarkable for its beauty. Such is its value in manufactures as an ornamental wood that some of the forests where it once grew abundantly have now scarcely a single specimen. New plantations have been set out, so that the supply will not be exhausted.

Tucson, A. T., has renewed its contract with the Electric Light Company, and the citizens rejoice thereat.

Useful Information.

Art in Oiling Shoes.

A one-armed bootblack having taken the contract to oil the shoes of a reporter, after the preliminary brushing began by rubbing the leather with a wet cloth. When asked what it was for he explained: "When I began this business," said the operator, pausing a moment to cast an admiring glance at the high, aristocratic arch of the newsgatherer's instep, "I used to keep on rubbing the oil into the leather until a man told me to stop. I thought they'd know when they had enough and I wanted to give satisfaction. Some of my customers complained that the oil soaked through their boots and caturated their socks. I thought perhaps I had been putting on too much oil, but the same fault was found in several cases where I had been more careful. Finally an old shoemaker, whom I knew, came along and I asked him what I ought to do to save my trade. He told me never to oil a shoe until I had wet it first. The reason was that the water would penetrate the leather and, remaining there, keep the oil from soaking through. Besides, the water would soften the leather and open it so that the oil would do the leather more good. My trade has prospered ever since.

Why Kerosene Oil Barrels are Painted. "I was oiling a man up one day, and he asked the same question you did. When I explained the reason, he said that was on the same principle as that of painting kerosene oil barrels. I told him I thought they were painted blue just to look nice. He said it was to prevent the barrel from leaking. During a long voyage or a long journey by rail sometimes half a barrel of oil would leak through the pores of the wood and evaporate. So some sharp fellow began to study some way of preventing such loss. He first painted the barrel blue on the outside, and then filled it with water and allowed it to stand until it had soaked up all it would. Then the oil was put in. The water kept the oil from soaking into the wood, and the paint on the outside kept the water from coming out. He got a patent on his discovery, and now he sits in his office and draws his royalty of one cent on every barrel made to hold kerosene oil for shipment. He's got a mighty soft thing on oil barrels." By this time the master of the art of oiling shoes, having rubbed a quart bottle of neatsfoot oil into the reporter's $15 gaiters, rested from his labors and gracefully accepted the half-dollar which was dropped into his palm.

Waxing Floors.—To wax a floor properly we first clean it with turpentine, so that not a speck of dirt is left either on the surface or imbedded in the exposed pores of the wood. If the wood is rough we sometimes scrape it and give it a coat of shellac to fill the pores. When it is perfectly hard, dry and smooth, we apply the wax in one or two ways, either hard or melted, with turpentine. In the latter it is laid on with a brush, left to dry two or three hours, and is then polished with brushes. The wax used is common beeswax. Here is one of the brushes, very large, flat, and made with very stiff bristles. They cost $4 a pair, and are made large, so that if desired one of them can be fixed under the foot by means of a strap, and the polishing done by wagging the leg to and fro. That way of brushing is employed in dry waxing, which is much the hardest, and requires most vigorous polishing. Dry waxing costs about four times as much as the other, and will last two or three times as long. In either case the wax has to be polished right into the grain of the wood. It will not do to put oil on a waxed floor, as it will render the surface gummy and sticky and nasty. If properly done, oiling makes a floor nice, but is never so good as waxing, and costs nearly as much. Raw linseed oil mixed with turpentine for a drier is used.

New Material for Clothing.—A new material for outside clothing has made its appearance in our shops, says the Boston *Advertiser*. It is called "Puttoo," and is an East India article of homespun which is intended for ordinary use, and from its rough texture is particularly adapted for traveling suits. Most East India wearing apparel which is familiar to Americans, is like the crinkled seersucker, designed for the hottest weather, but "Puttoo" is a fabric which is evidently designed to exclude cold rather than heat. In this connection it may be remarked that Irish poplin is coming into favor again. It is said that a Dublin manufacturer has just produced two superb specimens of the fabric for a prominent society lady of title. One is poppy-colored, and soft and rich as the most delicate silk; the other has a pure white ground, wrought with a dainty pattern of gold work so close in construction as to warrant the name cloth of gold, which has been applied to it.

The Mason Cotton Picker seems to have proven a perfect machine from the start, and that, too, for performing about the most complicated work which has ever been attempted by machinery. It is pronounced scarcely second in importance to the cotton-gin. Commissioners appointed on behalf of the New Orleans Exposition have followed the machine in the field, and record their official opinion that one picker, carefully driven, drawn by one mule and followed by three gleaners, will do the work of forty pairs of human hands. The flying metallic fingers pluck only the full-blown cotton. The plants are uninjured. The fiber thus plucked is automatically bagged.

An Inexpensive Filter.—Very many families desire some inexpensive device for filtering rain and other waters, to be used for cooking and table use. A cheap and very efficient filter may be made by using a spirit of wine cask, placing it on end with the head removed, and having a faucet at the bottom to draw off the clear water. To fit it for the filter, take the removed top head of the cask, and, with a small bit bore holes all over it: then place four clean bricks or blocks of wood on the bottom, and on these rest the perforated top. Now fill upon it about four inches of charcoal chopped into small bits the size of peas; over this put a layer of sand six inches deep. Impure water poured into the cask on the top of the sand will become clear and sparkling after awhile, or as soon as all fine particles are worked out by the charcoal and sand. This filter will not need renewing oftener than once in two or three months.

Use for Spent Tea Leaves.—Save the spent tea leaves for a few days, then steep them in a tin pail or pan for half an hour; strain through a sieve, and use the tea for all varnished paints. It requires very little elbow polish, as the tea acts as a strong detergent, cleansing the paint from all impurities, and making it equal to new. It cleans windows, sashes and oilcloths; indeed, any varnished surface is improved by its application. It washes window panes and mirrors much better than water, and is excellent for cleaning black walnut and looking-glass frames. It will not do to wash unvarnished paints with it.

In Canning Fruit.—It is needless trouble to heat or put the cans in hot water; just set them on a crash towel or any cloth that has been folded double or triple, and dipped into water, and dip the hot fruit into them; of course there must not be a draught of air on them.

Pickles or vinegar will not keep in a jar that has ever had any kind of grease in it.

Never put a hot iron directly upon silk—it takes the life out of it.

Good Health.

Effect of Alcohol on the Human System.

Dr. J. G. Jewell recently delivered a very interesting and instructive lecture on alcoholism in the Young Men's Christian Association Hall in this city. The lecturer, after a brief allusion to the alcohol family including carbolic acid, creosote and caustic, called attention to the fact that $1,500,000,000 was spent each year in the United States for alcohol and tobacco, and but $505,000,000 for bread. Among the adulterations of liquor he mentioned strychnine, a grain and a half of which would produce death. Adulterated liquor was accountable for many a death, but all alcohol, whether drugged or pure, was a man's most determined and deadly enemy. By means of charts, the doctor pointed out the difference between a healthy stomach and that of a toper, the worst being one with cancers in it. He pointed out the peculiar characteristics of alcohol on the human system; called attention to the sudden death among drunkards, and explained that alcohol stopped digestion upon being taken into the stomach, and those addicted to its use became dyspeptic. If a patient dies of delirium tremens, the stomach will be found black from mortification. The corroding effects of drink upon the nerve cells, the muscular fibres and the blood were pointed out, and attention was devoted to the fact that from the use of alcohol the brain becomes intensely red and congested. Some authorities maintained that the brain never recovers from the effects of drink. The brain was so soft that a skull was necessary to keep it in shape and so delicate that the sharpest knife could scarcely cut it without tearing it. Under the effects of drink the brain becomes hardened so as to be distinguished by the surgeon's touch. The brain is literally pickled in alcohol. In alluding to the effects of alcohol upon the heart, he explained that that organ beats 100,000 times a day, and its lifting power is equivalent to 1,036,500 pounds—more than 500 tons—one foot high. Drink caused fatty degeneration of the heart and an enfeebled action. In this condition excitement and exertion often caused death. In a brief allusion to beer, the doctor held that the fat it produced was like suet; it didn't make nerve, muscle or sinew. It made people dull and sluggish. Nursing mothers often thought that it quieted the child, but the child was quiet because it was intoxicated. In conclusion he intimated that the drunkard's disposition and failings were transmitted to his children.

Inhaling the Smoke of Cigarettes.—The inhaling of the smoke of cigarettes has been a common practice, and unless one is graceful in the art they are not considered professional consumers. The London *Medical Times* in commenting upon this subject, says: Of ordinary cigarette smoking we say nothing; we do not believe that smoking a dozen cigarettes a day, in the ordinary way, ever did a grown up person any tangible harm. But inhaling the smoke is a very different thing. Let even the most inveterate smoker try this and he will be convinced. Let him smoke an ordinary Turkish cigaretto while walking, and at some distance from a meal, inhaling the smoke well into the bronchial tubes. Then if, before he has finished his cigarette, he does not find his head grow dizzy, or his heart begin to thump, or his fingers tingle, we shall be quite ready to congratulate him on the possession of an excellent organism. Whether the effect is due to an impression on the termination of the vagus, or whether the active principle of the tobacco is absorbed and carried straight to the heart in the blood current, we shall not undertake to describe; we only describe the fact.

Death-Dealing Dish-Cloths.

"I had some neighbors once—clever, good sort of folks. One fall four of them were sick at one time with typhoid fever. The doctor ordered the vinegar barrels whitewashed, and threw about forty cents worth of carbolic acid into the swill-pail and departed. I went into the kitchen to make gruel. I needed a dish-cloth, and looked about and found several, and such 'rags!' I burned them all and called the daughter of the house to get me a dish-cloth. She looked around on the tables. 'Why,' she said, 'there was about a dozen here this morning;' and she looked in the wood-box and on the mantle-piece, and felt in the dark corner of the cupboard. 'Well,' I said, 'I saw some old, black rotten rags lying around, and I burned them, for there is death in such dish-cloths as these, and you must never use such again.'

"I 'took turns' at nursing that family four weeks, and I believe those dirty dish-cloths were the cause of all that hard work. Therefore, I say to every housekeeper, keep your dish-cloth clean. You may wear your dresses without ironing, your sun-bonnets without elastics, but you must keep your dish-cloths clean. You may only comb your hair on Sundays, you may not wear a collar unless you go from home; but you must wash your dish-cloth. You may only sweep the floor 'when the sign gets right;' the windows don't need washing; you can look out at the door; that spider-web on the front porch don't hurt anything; but, as you love your lives, wash out your dish-cloth. Let the foxtail get ripe in the garden (the seed is a foot deep anyway); let the holes in the heels of your husband's footrags go undarned; let the children' shoes go two Sundays without blacking; let two hens set four weeks on one wooden egg; but do wash your dish-cloths. Eat without a table-cloth; wash your faces and let them dry; do without a curtain for your windows and cake for your tea, but, for heaven's sake, keep your dish cloths clean."—*Western Magazine.*

Effective Cures.

The following are furnished by Mrs. Sarah J. Agnew, Agnew's station, Santa Clara county:

To Prevent Mortification.

Make a poultice of flax-seed. After the same has cooled to about blood heat, mix in, by stirring, one tablespoonful of powdered charcoal and three tablespoonfuls hop yeast. Then spread on part affected. Renew occasionally. This is very effective in drawing out inflammation, and has been known to arrest mortification after the same had set in.

To Put Back or Cure a Felon.

Take unslacked lime and white of egg. Beat together and place on a cloth. Apply to the felon, and change every 10 or 15 minutes for new poultice.

For Sore Eyes.

Take an eggshell broken at one end to let out contents, and fill up with soft water; put in as much white vitriol as could lay on the point of a penknife, a lump of sugar size of a small nutmeg, and a little pinch of salt. Thus filled set the eggshell in hot ashes, until it comes to a boil. Set out and strain and it is ready for use.

The New Anæsthetic.—The new anæsthetic, hydro-clorate of cocoaine, is steadily working its way into more general use in operative surgery. It promises to become quite as great, if not a greater boon to suffering humanity than the original discovery of ether. A very successful operation was recently performed by its aid upon a man's tongue, by Dr. Ree, of Rochester, N. Y. One half of the tongue, which had become seriously affected with cancer, was removed without pain to the patient. The cocoaine was applied to the left side of the tongue and rubbed in, and soon the flesh became insensible to the thrust of a needle, and was as cold as ice, while the right side was in its normal condition. The knife was then applied, and the left side of the tongue was successfully cut away without pain to the patient. Surgeons have thought that the drug would not be useful except in superficial operations.

Onions as a Disinfectant.—A pan of sliced raw onions placed in a room where there is diphtheria will absorb the poison and prevent the disease from spreading. The onions should be buried every morning and fresh ones cut up.

Hartshorn for Stings.—Hartshorn applied to the stings of poisonous insects will allay the pain and stop the swelling, or apply oil of sassafrae, which is better. Bee stings should be treated in this way.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA

Amador.

MIDDLE BAR TUNNEL.—Amador *Ledger*, Feb. 28: This great boring enterprise has now reached a distance of 2,000 ft. Early this week a vein of the same rich, black gold-bearing metal was encountered, proving conclusively that the seams of free gold reaches to great depths. The general character of the quartz shows marked improvement as the header advances north.

SOUTH SPRING HILL.—Everything was in readiness last week to start up the new hoisting machinery, when an annoying blunder was discovered, which will delay matters a couple of weeks. It was found that the reel, instead of holding 1,000 feet of flat wire rope, as the order called for, would only hold a little over 600 ft. The manufacturers sent cable five-eighths of an inch thick instead of three-eighths. It has been shipped back, and the new rope is expected up next week. The roof of the hoisting works has been decorated with a coat of fire-proof paint, and hand grenade fire-extinguishers are kept ready as a precaution against fire. The mine is looking fine. We were shown samples of ore extracted last Monday, in wich free gold was visible in a number of places. The mill is kept running steadily.

KITTERIDGE CLAIM.—This quartz claim situated 2½ miles south of Jackson, on the same ledge as the New York mine, was bonded this week by W. W. Carlile of Ione, and Henry and George Haines of Stockton. The bond runs for three years, and the purchase price is $6,000; $1,000 to be paid as soon as the tunnel now being run into the side hill, reaches 60 ft beyond the shaft, the balance in two yearly installments of $2,500 each. There are two shafts on the property, each about 30 ft deep, disclosing a well defined ledge between 5 and 6 ft wide. There is over 100 tons of ore on the dump. Samples taken from the dump-pile show free gold. The new company intend to enter upon the development of the property immediately. A two stamp mill is to be put up at once to test the milling quality of the ore, and if it proves satisfactory a ten-stamp mill will be erected at onee. Six men will be kept at work at the mine, and work prosecuted day and night. The tunnel now being run into the hill will strike the ledge at the depth of 60 ft from the surface. Good judges of quartz say there is an excellent prospect for the development of a paying mine. The ledge runs parallel with the mother lode. The work of development will be prosecuted under the personal supervision of W. W. Carlile.

MISCELLANEOUS.—The Gover mill is again running on the old dump pile. The Bunker Hill sulphurets works have closed, on account of being out of order. The sulphurets are being shipped to the Drytown works for reduction.

STARTED UP.—Amador *Sentinel*, Feb. 28: The St. Julian mill started up this week. McNamara & Doyle have been awarded the contract to run 100 ft further tunnel for Shugert & Morgan. The Glenn hydraulic mine at Upper Ranchena is now piping in full blast. Another seam of metal ore was struck in the face of the big tunnel Monday, and 200 pounds or more of the rich stuff brought to the surface. The presence of these streaks at the depth which the tunnel taps would almost certainly indieate a continuous ore body from the surface down. The aeeepted theory has been that these black metal deposits were mere freaks and could be found only at the surfaee. The discovery of the past few days go to disprove this, and make it almost certain that the Middle Bar region will ere long have more than one riehly paying mine.

El Dorado.

THE GREENSTONE BELT.—El Dorado *Mt. Democrat*, Feb. 28: On Monday last a *Democrat* reporter visited the mines situated on the Greenstone belt two miles west of El Dorado. These nines are situated in a vast serpentine belt, that commencing in Amador county runs diagonally across this county in a northerly direction. That prospectors have faith in the ultimate value of the mines in this formation, is best attested by the fact that every indication of quartz has been located for a distance of 12 miles. The first mine visited was that of Crane & Elliott. Here we find the deepest shaft that has ever been sunk on the ledge, the northern incline being 300 ft in depth. Fifty feet south the owners have sunk a vertical shaft, 160 ft in depth, and very fine ore is being taken from the 140 ft level in this shaft. The owners intend to resume work in the deeper levels as soon as a new pump is put in the shaft, the old one being inadequate to keep the mine free from water. The owners have very complete machinery, the hoisting works being operated by water power, water being obtained from the Park Canal Company. North of the Crane & Elliott is the present "bonanza" of the belt, the Florence, owned by F. B. Tnek. At this mine a shaft has been sunk to a depth of 70 ft; a drift running north from the bottom of the shaft a distance of 180 ft. The ore that is being taken from this level is of a fabulous richness. Prospects taken promiscously from all parts of the dump going from 25 cents to $10 a pan. The appliances for a successful working of this nine are very complete, the hoisting works (water power), pumps, etc., being of the most approved pattern. It is the attention of the owners to sink a new shaft 100 ft south of the present works, and also construct a mill at an early day. One thousand feet north of the Florence, we come to the Barns mine. This is the pioneer mine of the belt—has been worked for the past eight years, and at a great profit to its owners, Henry Barns. Two shafts have been sunk, an incline 150 ft in depth, and a vertieal shaft 220 ft in depth. It was in this shaft that the recent rich developments were made. The ore on the 200 ft level carrying a large pereentage of tellurium. The hoisting is done with a whim. Like every mine on this belt, the ledge matter for the first 150 ft was soft and easily exeavated. After attaining that depth the ledge becomes hard and compact. North of the Barnes comes the Eureka, owned by Graham Brothers, of Shingle Springs. Very rich ore has been taken from this mine. A well timbered shaft has been sunk to a depth of 125 ft. Nothing is being done, however at the present time. On the Hayes mine, north of the Eureka, a shaft has been sunk to a depth of 40 ft with very flattering prospects. One-half mile west of the Greenstone belt, lies the North Star owned by Sacramento parties. They have a very wide ledge averaging 10 ft. A 40 ft shaft has been sunk, and the owners think they have a big thing.

BLAIR MINE.—Work at the Blair mine, situated in the same belt as the Union, is steadily progressing. Very rich ore is being taken from the lower stopes, and the mill crushing night and day.

AT THE UNION MINE.—Under the superintendency of Jesse Wall, a shaft has been sunk a distance of 164 ft. It is the intention of the owners to continue sinking until a depth of 300 ft has been attained. No crosscutting is being done at present, enough ore has, however, been uncovered to keep the mill crushing for the next five or six months, some of the ore being of a very high grade.

Inyo.

AROUND KEELER.—Inyo *Independent*, Feb. 28: Thomas Boland has 15 men employed at Cerro Gordo. They are getting out a great deal of ore, all of which will be shipped to Selby & Company, San Francisco. Competent judges say that within easy reach of the Hawley mill there are tens of thousands of tons of ore containing $25 per ton in silver and gold, and claim that with proper management it can be worked in the mill at a fair profit. From the Jim mine at Darwin, J. S. Gorman is now getting out ore of good quality; teams are hauling the ore to the furnaee, and a run will be made soon. The Nevada Salt and Borax Company are making an interesting experiment at Keeler. The water of Owens Lake carries a very large percentage of soda in its various combinations, and the aim of the company is to get the soda from the water and use it in making borax. A number of vats are dug in the ground close to the edge of the lake; these vats are 75 feet long and 30 feet wide; water is pumped into them from the lake and kept at a depth of about 18 inches. The daily evaporation is nearly three inches, and the quantity pumped into the vats daily is equal. At the end of six months the vats will be allowed to dry out and the soda will be gathered. The process has not yet been in operation long enough to determine whether it will be a success or not. Mr. James Stansbury is in charge of the work. During a recent visit to Wild Rose district, Mr. Day made an extended examination of the mines there. There are 12 mines now known and partially opened, and all have ore that would be considered high grade, even in the most noted mining districts of the Pacific coast. The ledge now opened runs all the way from three to fifty feet wide; much of the ore runs up into the thousands of dollars per ton; but there is good reason to believe that all now in sight would average at least $60 per ton. This new district promises to be a valuable mining field.

Mariposa.

DILTZ MINE.—Mariposa *Gazette*, Feb. 28: Owing to the searcity of water, which has been materially less than any previous season, Captain Diltz, the proprietor of the mine, has discharged his men and suspended work for the season, except an abundant rain should fall in March. Up to the present he has used the supply of water at his command in the most advantageous manner and which has served a double purpose. Frist in removing the large bank of dirt by running it through a long chain of siuices, which with the aid of quicksilver catches all the fine gold and uncovers specimens of rich float rock, valuable deposits of ore and decomposed quartz which this mine has always been exceedingly favored with. Secondly, the last wash was utilized in such a manner as to uncover some 40 feet of the true fissure which is shaped like the roof of a house and is 25 feet aeross a short distance below the comb of the vein. The Captain considers this to be one of the most remarkable developments yet struck upon the vein. Gold is to be seen all through the work, besides several hundred dollars have been taken from the surface and outcroppings, which goes to prove most conclusively that his last work is on the apex of a rich chimney of ore, on which a shaft will be sunk as soon as he is satisfied the rainy season is past. Some beautiful specimens of coarse gold are frequently picked up from the wash of this mine. Notwithstanding the mine possesses an independence for its owner outside of the main vein from which thousands of tons of ore and rock have been taken and piled up with a view to grinding in a mill.

SWEET WATER.—The works at the Groves' mill and mine, which is bonded to a company was to have started up this week. Everything is said to be in fine order and with a quantity of good ore in sight everything bids fair of suceess about the mine. The Ferguson mine owned by Jimmy Ferguson is one of the best in the county. It has a new eight-stamp mill complete in all its parts, with a vein of quartz that will yield a fair average to the ton, and will be a permanent institution.

Mono.

THE BODIE CON.—Bodie *Univer*, Mar. 2: At the mine the north drift 300 foot level is in 97 feet. The south drift 500 foot level is in 88 feet. The south upraise 500 foot level is up 110 feet. The joint upraise 550 foot level is up 188 feet. We started the mill to-day. Twenty-nine men employed.

THE MONO.—The Mono south drift is in 85 feet, an east crosscut from it is in 15 feet. Upraise No. 2 from drift 30 feet above the 550 foot level is up 13 feet, we find bunches of good ore in it. The joint upraise 550 foot level is up 188 feet. Eight miners were employed.

THE CON. PACIFIC.—Since last report Pacific ledge No. 1 has been advaneed to a total distance of 229 feet from chute. During the week we have cut into an entirely different formation from any heretofore encountered in the drift. It is identical with that cut in all approaches to the Fortuna vein, and is filled with seams and bunches of fine looking ore which becomes more numerous and better defined as we advance. We are strongly encouraged to hope we will very soon cut into something of importance. In the crossent to cut Pacific No. 2 weare also much encouraged. We find the ground strongly mineralized and more kindly as we approach the vein. The presence of small stringers or feeders at short intervals we regard as a very favorable indication.

Nevada.

MOUNTAINEER.—Nevada *Transcript*, Feb. 28: John Snyder, late of San Jose and one of the principal owners of the Mountaineer mine at this city, has succeeded H. G. Battey as superintendent of that property. Fifteen of the 20 stamps in the mill (which is equipped with six Frue eoncentrators) are being run night and day, the other five being used from time to time on the highest grade of ore taken out. Last Sunday a five foot ledge of excellent quartz was developed in the 300 level, and this in connection with the former developments makes the mine one of the most promising in the county. It has for some time been a regular dividend payer. The bulk of the stock is held by four residents of San Jose. The average thickness of the ledge of the Neversweat mine, Willow valley, is two and a half feet, with a streak of from six to eight inches of exceedingly rich ore running through it. O. Maltman has purchased three tons of this, paying $140 a ton for it on the dump. The Constitution has a four-foot vein carrying a 15-inch ledge from which assays have given as high as $1,500 a ton. It is estimated that 15 inches will mill something like $200 a ton. The Constitution is on Deer creek above the Deadwood and on the same bank. It is reported that the Derbec drift mining company will soon substitute water power for steam in running the machinery. If such a step is taken their expenses will be materially reduced and the mine again placed on a dividend paying basis. This company pays out enough every year for wood for a few dividends to stockholders. If tbey had had water power during the past five years it would have made a big difference to the stockholders. The new mill at the Eagle Bird mine, Washington, which was made at Allan's foundry in this city, is running regularly and in the most satisfactory manner. The mine looks better and better with every stroke of work done. The ledge has widened to 15½ feet, and every ounce of the ore pays for working. There are plenty more claims in that part of the county which will be just as valuable as the Eagle Bird when they have been as much developed. John Hippert came down Tuesday to purchase another pump for his mine—the Rocky Glen—near Graniteville, the present pump not being of sufficient capaeity. The Rocky Glen is producing well regularly, being one of the best claims in that part of the county for the amount of labor and capital expended on it.

WASHINGTON.—Cor. Nevada *Transcript*, Feb. 28: The Walters mine is situated a few hundred feet to the east of the Eagle Bird mine and the highest up the river of any mine that is yet opened in this district. The owner has run a tunnel from the south bank of the river quite a distance into the mountain and is yet driving it ahead, as I am informed, with good encouragement. He has no machinery on his mine yet for crushing his ore. He has quite a large pile of ore on the dump ready for milling. We will now cross the north and adjoining the Eagle Bird mine, to the Blue Bell and Sunset mines, both owned by one company. They have opened on their mines in several plaees and have found high-grade ore in every opening with the exception of one. They have one of the finest loeations for free water and a mill plant there is on the river. They have been working as their means would permit for several years, getting their mines well prospected before going to the expense of costly machinery. One of the owners has built a house and blacksmith shop on the mines and is preparing to erect crushing machinery on one of their lodes this coming season. He has his dam and aqueduct in and water running through ready for hydraulic pipe to drive machinery with, and is now with the Champion Lode company building a road from Fall creek on the north side of the river to intersect with the Yuba company's road at a point near the Cornucopia and Secret Treasure mill. This road will be an opening to get in supplies to each of the four mines that are getting ready for machinery. We will now cross Fall creek and on the same side of the river and in the same direction and adjacent to the Blue Bell mine is the extension of the Champion Lode, owned by John Grissel and Wilson Foster. They also have good prospects ahead for the amount of work done on the lode. The Old Champion is the connecting link between the extension and the Lindsay mine. The Old Champion (or Governor Morton, as it is now called) has been opened for several years and of late years only had assessment work done on it until this winter, when it changed hands and they are now starting a tunnel a few hundred feet below the old one. It is opening in on ore showing well in free gold, sulphurets and galena. Here, too, we expect to hear the pounding of stamps before the summer is past. We will not go way up on top of the mountain this time to see what neighbors Bell and Greathouse and others are doing, but we will keep elose to the river. We have no more prospecting going on now on the north bank of the river until we get to the Cornucopia and Secret Treasure, which works and mines you gave a diseription of a short time ago. They are taking out of a shaft near the mill as nice ore as we have seen for many a day. It is spotted all over with gold. Next we come to is the south end of the Champion Extension where it crosses the river and runs into the mountain on the south side of the river. Next we come to is the Crœsus mine situated on the east side of the old and well known Yuba mine. The Crœsus has lately been opened in two different places on the lode and they found a vein varying from one and a half to six feet thick, showing well in free gold, galena and sulphurets. This mine, as well as the other ones mentioned, has the advantage of great water pressure. They have from 180 to 1,500 head, and most of them can be worked for a life time without sinking or having to pump, which is a great saving. It is a mistaken idea that many have that the mines here are high up in the mountains. Those just mentioned are only about six hundred feet higher than Nevada City, and I think it is not any colder here than with you.

MINING MACHINERY.—Nevada *Transcript*, March 2: Four tons of machinery for the Delhi quartz mine near Columbia Hill has arrived here by rail. It consists of feeding, eoncentrating and other apparatus required to fit the mill up in first-rate shape. The Delhi is owned by Judge Searls, R. McMurray and others, and is believed to be a very valuable property.

A BIG CLEAN-UP.—An immense clean-up (the first general one since the new mill was erected) has just been made at the Eagle Bird mine, Washington. The bullion was taken below *via* Emigrant Gap. The Eagle Bird ledge is 16 feet thick.

Plumas.

PREMIUM NO. 2.—Plumas *National*, Feb. 28: A great deal of interest is manifested in the recent development made by Mr. Hallack in his quartz mine, near Taylorville. The peculiar character of the ore, in connection with its extraordinary yield, has excited much interest and surprise among the quartz mining class. From what we learn, Mr. H. has been for several days engaged in milling rock that will yield $100 per ton. The outlook is very promising. This development has been made in the immediate vicinity of the old Premium mine, some three miles below Taylorville. At present the owner has engaged the use of the five-stamp mill of the Young Brothers. From all we can learn, a new era is about to dawn in that section in quartz mining. Three thousand dollars yield from 23 tons will do very well for a starter.

EAST BRANCH.—The weather is fine and everybody busy at work, with good prospects. Hallsted & Hard are piping on Dingbat with a good head of water, and will undoubtedly make a good clean-up. C. R. Hallsted is still on the coarse gold lead, and doing well. Frank Jackson is ready to run, soon as water starts; also Mrs. Hyde's claims at 12 Mile Bar is ready and waiting for the spring run, but the outlook for a good water season is rather poor, there being no snow on the mountains. A. H. Brooks is getting out some good quartz, that shows plenty of the "filthy lucre." Fred Lewis' claim on Rich gulch, is on top now in the way of rich prospects. He is piping the surface with what water he catches in the reservoirs, and prospects quartz while they are filling up. It is reported that he has rock that pays from $1 to $2 per pound. McPherson has commenced operations on the Deadwood side of the ridge, with good prospects. We expect to see things hum on Rich gulch this summer.

COPPER MINE.—Greenville *Bulletin*, Feb. 28: While in Taylorville, we were informed that arrangements are nearly completed whereby a 30-ton Water Jacket furnace will be erected on the Engles Copper claim during the coming summer. The ledge is now 50 feet wide, and it is believed to be a good quality of ore. We hope that the owners shall be able to construct the furnace and that they will realize a handsome profit from the mine. The success of this enterprise is of great importance to this section. It may lead to the construetion of several other furnaces on the mine, as there is an immense body of ore for reduction.

ARGENTINE MINE.—Plumas *National*, Feb. 28: This mine is situated about 12 miles from Quiney, and is very favorably loeated for cheap milling, there being a good water power, and plenty of timber convenient to the mine. It is owned by C. Lee & Sons and Mrs. Edwards. Mr. James Thompson, an experienced miner and amalgamator, is superintendent, and from his success in making it pay, evidently understands his business. The second clean-up was made last week of $458 from 100 tons of rock. As the cost of milling is about $2 per ton, there is a handsome margin left for the lucky owners.

San Bernardino.

LONE STAR.—Calico *Print*, Mar. 1: From A. G. Rhodes we learned that his Lone Star group of mines in West Calieo are looking well. Work on the Lone Star has seen progressing for several months. The shaft is down 70 feet, the tunnel in 100 feet. The main ledge is well-defined, runs north and south and dips east. A large vein on the west of the main ledge dips east, and over a dozen on the east dip west, which no doubt converge to the main ledge. Almost 20 tons of good ore have been taken to the mill. 12 tons to Barker's and the rest to Waterman's. The ore can be hauled direct to Waterman's by the new road made to the mines on the west. Messrs. Evans & Tait are interested in the output of the mine, and Mr. Raymond owns a one-sixth interest in the claims. There are four companies of chloriders at work on the mine, consisting of eight men. We were shown a solid chunk of ore weighing 260 pounds, which assayed about $1,000 to the ton. Immense bodies of low grade ore that will pay to mill exist in this group and enough high grade can be taken out daily to operate the mine with a profit. It is reported in Calico that C. J. Perkins has bought the Big Horn Adder mine in West Calico. Consideration about $5,000.

Sierra.

CLEANED UP.—Mt. *Messenger*, Feb. 28: The Bald Mt. Extension Co., at Forest City, cleaned up 86 ounces last Sunday. The working force was increased this week. Red Oak Co. are now in soft picking slate bedrock with a favorable prospect of soon reaching pay gravel. The bevel gears for Mr. Hill's arastra are nearly done, and the work of crushing will be resumed on Monday. Jerome York finds no difficulty in getting rock enough to keep the Slug Canyon mill running night and day. Marguerite Co. have their shaft nearly drained, and the machinery will be started in a few days. York & Tschanis (pronounced Johns) have struck the ledge in the extension of the Slug Canyon, and find the rock good, gold being visible to the naked eye in much of it.

Siskiyou.

PICK AND PAN.—Yreka *Union*, Feb. 26: John Wagoner found a $54.50 nugget in Printy gulch a few days since. There is an abundance of water for mining purposes in the Deadwood district. The proprietors of the Mott claim on Klamath river are getting out timbers for wing-damming. Miners in the Cottonwood district report a scarcity of water, and it is believed that little mining in that section will be done this season. Louis Davis & Sons on the divide between Hiyou gulch and Deadwood, are working a ledge that prospects well, and expect to make a good cleanup. McNeal & McLaughlin, near Oliver's Flat, on Salmon river, cleaned up $500 from a 6 ft sluice at the head of the spring one day last week. The river miners on the Klamath are busily engaged in making such improvements as the condition of the river will permit, preparatory to getting an early start when the waters fall sufficiently. Many people appear to be unaware of the fact that a number of the richest New River discoveries extend over into Siskiyou county. Prospectors agree that the best field for prospecting lies within the borders of this county, just over the Trinity line. The Montezuma placer mine at Callahan opened for the season Sunday with a force of 15 men under the superintendency of Mr. James B. Parker, who successfully worked the claim last year. This mine is one of the most profitable and best equipped in the county. The two Portuguese companies on Cherry creek are running full time, with a good head of water, and are working in good ground. Each company has a splendid 3 ft flume, and their water supply is obtained from two reservoirs, which they use alternately. Tucker & Co., below the junction of the east and west forks of Deadwood, have crushed with their 5-stamp mill upwards of 150 tons of rock since they started. Their rock has paid well in former seasons.

and there is every indication that the richness of the ledge has improved. They will clean up in two weeks. Messrs. George Smith, R. H. Campbell and George C. Spooner, owners of the Summerville hydraulic mine on the south fork of Salmon, have in their employ 40 men. Twenty-seven of the number are engaged in constructing their 4-mile ditch, and the remainder are employed in the sawmill and mine. The Humming Bird ledge, located a little above the conjunction of the east and west forks of Deadwood, and owned by Messrs. C. H. Pyle & McCook, is being rapidly developed, and is considered to be a paying discovery. Two tunnels, each over 200 ft in length, have been driven, and the permanency of the ledge is established. Their arastra has been running for some time and a cleanup will shortly be made. The assayer's certificate shows that the rock goes $80 to the ton in gold and 50 in silver. It is no longer a matter of doubt that the New River discoveries will prove of more benefit to Siskiyou than to Humboldt and Trinity counties. Already large orders for grain, bacon and vegetables have been received by our merchants and producers, and pack trains are spoken for many trips in advance after the packing season opens. Trinity county cannot produce sufficient for her consumption, and Humboldt is but little better, consequently the New River trade must fall to us. Our location, superiority of prducts and low prices make Siskiyou the natural market for the New River section.

Tuolumne.

A RICH STRIKE.—*Union Democrat*, Feb. 28: Mike Shine and Dave Oliver have struck it big in the old Patterson claim on Bald mountain, which they have been working on a lease from Ed. Garrett. Last Saturday they began to find gold and ever since have been taking it out by the fist full. Wednesday they took out a chunk weighing 15 pounds almost pure gold. The extent of the find is as yet unknown as the boys are somewhat close-mouthed in relation to their strike, but it is certain that they have taken many thousand dollars in the past week. The lowest estimate place the sum at $10,000, while others raise it to several times that amount. It is hardly possible that the boys themselves know with any exactitude how much they have got, as they have not got the "pocket" cleaned up. They have four mortars going, pounding up the quartz. It is said that there is still gold in sight in the mine. David Hunt, who has taken a six months working bond on the Maryatt mine, at Tuttletown, will commence operations next week. He has let a contract to Sam Hoskins to clear the mine of water. As soon as this is done Mr. Hunt will proceed to sink the shaft, which is now down 104 feet, to a depth of 200 feet. He will also run levels and thoroughly prospect the mine, and at the same time make a thorough working test of the ore. All up around Confidence the ground is perfectly bare of snow, and the roads are dry and dusty, something remarkable for this season of the year. Up towards the summit there is but little snow, and if there is not a heavy fall before spring the streams will be very low this summer. It's likely, however, that there will be some heavy storms in the next few weeks.

Trinity.

TO NEW RIVER DISTRICT.—Trinity *Journal*, Feb. 28: John Adams was in town this week from North Fork, having returned from a trip to the New River mines only a few days ago. He took in a couple of passengers, having a train of three saddle and two pack animals in all. The trip was easily made from North Fork to Rattlesnake the first day and from there to the mines the day following, and it was easy to return in two day. He says a very little work in "brushing out" will make a trail from Rattlesnake to the mines, the distance being about 15 miles.

NEVADA.

Washoe District.

HALE AND NORCROSS.—Virginia *Enterprise*, Feb. 28: They are in eight feet on cross-cut No. 2, 2900 level, and all in good ore, some of it being very rich. On the 2800 level, at the point above where they are now at work on the 2900 level, they ran through 45 feet of quartz before getting ore, which seems to indicate a large deposit. On the 3000 level they are cutting out a chute for dumping the rock and ore from the 2900 level, which at present is being stowed in the drifts.

OPHIR.—They are working the north lateral drift on the 500 level and will continue through the Mexican and Union ground.

YELLOW JACKET.—They are still working on the old upper levels and extracting a large quantity of low-grade ore.

GOULD AND CURRY.—Explorations are being made on the 1000 level of the Bonner shaft in ground never before prospected.

CROWN POINT.—The usual amount of low-grade ore is being taken out and shipped to the mills.

SAVAGE.—On the upper tunnel they are cutting good quartz.

CHOLLAR.—They are running a south drift on the 3000 level.

Columbus District.

MOUNT DIABLO.—Candelaria *True Fissure*, Feb. 28. The west drift on the sixth level is now in 146 feet, and the south cross-cut from this drift is in 30 feet. The west drift on the fifth level has advanced 12 feet during the week and the face is showing a little low-grade ore. The intermediate drift, between the fourth and fifth levels, has connected with raise from the fifth level. This drift is now being extended westerly and the face shows two feet of $100 ore. The stope near the foot of the raise from fifth level shows two feet of $50 ore. The stopes near winze No. 2, between the fourth and fifth levels, are yielding some $60 ore and look promising. The intermediate stope, between the third and fourth levels and east of the shaft, is yielding some $100 ore. The intermediate stope between the second and third levels and west of the shaft, is yielding a number of tons of $50 ore daily. A small amount of $80 ore is being extracted from the east drift on the second level. The intermediate stopes, between the first and second levels, are yielding a small amount of high-grade ore. A bullion shipment of $9,221.36 was made on the 22d instant.

Eureka District.

WILL CLOSE DOWN.—Eureka *Sentinel*, Feb. 28: With the exception of the refinery, all work at the Richmond furnaces will to-day be temporarily suspended. Just how long the suspension will continue it is hard to say. It may be for 90 days. Work at the refinery will continue until the crude bullion on hand is worked up, which will be in the course of ten days, when work there will also cease for an indefinite period. The cause of the suspension of operations is assigned to the condition of the roads and to a necessary overhauling of the machinery. It will throw upwards of 160 men out of employment temporarily.

Pioche District.

LEACHING.—Pioche *Record*, Feb. 28: There are being daily put through the leaching tubs at Bullionville 16 tons of tailings to each tub. The Company is putting up four more tubs, that will make ten in all, with a capacity to work 175 tons of tailings per day. The tailings are now dumped into the tubs as they are taken from the pit, through large chutes in the roof of the building instead of being put through the agitator, as was formerly done. This saves both time and expense. The company's tramway is running smoothly, and if they had had such a contrivance during the three years that they were smelting the Magnet and Raymond & Ely tailings it would have saved them thousands of dollars.

Reese River District.

AUSTIN STILL ALIVE.—Virginia *Enterprise*, Feb. 28: The Manhattan Company at Austin, Lander county, is putting machinery on the old Union shaft, which is 200 feet deep, and has been idle for many years. This will be cleaned out and repaired and sunk deeper. Powerful machinery is to be erected upon these works, and the business of prospecting this new country will be energetically pushed. Ever since the famous Whitlatch ledge was lost, that particular section has been looked upon with much interest, and now the company will prospect for it or any other ledge which may be shown up.

Taylor District.

TWO THOUSAND A DAY.—Taylor *Reflex*, Feb. 28: John Devlin and Mac. McLaughlin have struck it big in the ground leased from the Monitor Mining Company. They took out yesterday morning $1,000 worth of ore and the prospects were good for taking out another thousand before six o'clock. The ore taken out goes from $500 to $1,000 per ton. The ore body is about 12 feet from roof to floor, and good milling ore, two feet of which goes from $500 to $1,000 to the ton. In places the pick can be sent in up to the eye in clean chloride. The development in this piece of ground goes to show that this country is not half prospected yet.

Willow Creek District.

THE WILD DEER MINE.—*Silver State*, Feb. 28: John McGrath, assayer at Willow creek, arrived here Saturday on the way to Eureka. He says the Wild Deer mine, owned by H. H. McColly and R. McLeran, is proving to be very valuable. There is a drift 150 feet long on the lead, which is now five feet wide and assays about $50 per ton. This lead is a true fissure vein well defined and sufficiently developed to warrant the assertion that it is a good mine.

ARIZONA.

GOLD IN COPPER BASIN.—Arizona *Miner*, March 1: Uncle Ike Bradshaw, who came over yesterday from Copper Basin, brought with him a large boulder permeated with gold from a new find in the Basin. The ore assays $50 to the ton and is highly impregnated with iron. This ore can be worked with copper ores by smelter process and copper matte be made very valuable, for the gold that may be infused into it by mixing the ores. The fact is, Col. Bean does not know what he has got in Copper Basin. It is beyond the comprehension of man.

COLORADO.

GENERAL NOTES.—Georgetown *Courier*, Feb. 28: The Pay Rock mill has been receiving some new machinery. The Freeland is reported to be producing 40 tons of ore per day. A mill-run from the Duncan lode last Tuesday returned 310 ozs. silver to the ton. Six tons of ore were brought down from the Scotia last Saturday, which returned well in silver and lead. C. Koontze, of Empire, purchased a quarter interest in the Windsor lode last week, from John Husted of this place. Some nice shipments were made from the Corry City this week, the ore running from 160 to 200 ozs. silver per ton. Some excellent ore is being produced from the Orient, on Red Elephant Mt., the first class of which mills 1,700 ounces. A good streak of ore is being worked in the Eldorado, a new discovery on Leavenworth Mt., by Gus Williams and Sam Worthington. A party of three are leasing on the Charter Oak, Cascade Creek, and have an excellent pay vein. Their last mill-run returned them $125 per month to the man, above expenses. Snow is reported to be four feet deep on a level in the timbered portion of Ute Creek. Notwithstanding this fact, there is said to be more men in camp than for sixteen years. S. Phillips & Co. are driving west from the bottom of the Frostberg shaft on the Dunderberg, and have several inches of good ore. A recent shipment of 153 sacks returned 25 ozs. silver and 51 per cent lead. Fillius & Talley have the water extracted from the Phœnix shaft on the Maine mine, and there is a streak of good ore in sight.

THE SNOWDRIFT.—At the Snowdrift nearly all the available ground has been leased to good miners. About 50 men in all are now at work, leasing and on day's pay. The plan of development instituted some two years ago by Maj. Fulton, which changed the mine from long leanness into rattling good pay, is still being pursued under the same management, with most promising results. As an evidence of the miners' faith in the property, may be cited a single instance of lessees, who, having the option, decided, after drifting 50 feet, to drift 50 feet further before doing any stoping, in order to secure a 100-foot block of ground. A recent mill-run gave 295 ozs. while near this ground black sulphuret dirt, worth about 500 ozs., has been struck. The Peterson shaft is being sunk a second 70 feet below the tunnel, at the rate of over a foot a day. It has thus far gone down 15 feet on a good pay-streak. The new hoister is kept busy night and day keeping the shaft and drifts clear of broken rock.

IDAHO.

CLIFF TAILINGS.—Cor. Houston *Press*, Feb. 27: The Superior mine, owned by Owens and Hall is constantly improving and bids fair to become one of the leading feeders toward the growth and prosperity of your snug little town. The veins of ore matter are increasing in size and richness every foot that the miners go down. The main ledge is five feet wide, solid ore and of high grade. There are some 40 or 50 tons now on the dump. The deepest shaft is down 30 feet, all in ore. Work will be begun on the Alice sometime next week and will be continued indefinitely. Messrs. Lamb & Co. will get in a lot of supplies for the Alice mine as soon as possible. They contemplate sinking a shaft 60 feet and the running of a tunnel 150 feet before spring. The tunnel will be run to cross-cut the ledge. This mine carries a good, strong vein of high grade ore, mostly galena. Judge E. Francis Gray is visiting the numerous mines and prospects of Alder district with a view of reporting on them at an early day. You will probably receive some interesting mining news from him soon. The snow is rapidly disappearing, and prospectors are beginning to outfit for another season's campaign.

MONTANA.

INDEPENDENCE DISTRICT.—*Butte Miner*, Feb. 25: The Snow Drift and Silver Lick, adjoining the Margaret Ann lode on the north and west have been bonded to a California company for $45,000. The Silver Lick is owned by James Brogan, Frank Shovelin and James McQuillan. The Snow Drift is owned by "Billy" Wilson, Robert McMinn and John Branagan. The Snow Drift has a shaft 140 feet deep and levels have been run east and west 150 feet on a 3 foot vein of 40 ounce ore. The proximity of these two lodes to the Margaret Ann, which is considered one of the most valuable in this camp, makes them important. The trend of the adjoining lead shows conclusively that the purchasers, or their agents are experts, else they would not have figured so closely on the geological formation. The Snow Drift vein contains per-oxide of manganese, with black sulphurets and chlorides of silver. The ore is free milling above water level. The Silver Lick ore contains manganese, pyrites of iron, sulphurets and flecks of ruby silver.

THE HOPE.—This mine lies west of and adjoins the Anselmo. The owners, Robert McMinn, Wm. T. Boardman, John Leggat and Wm. T. Stevens, are negotiating a bond of $60,000. The vein is from three to ten feet in width and goes from 40 to 1,500 ounces in silver. The ore contains sulphurets of silver, argentiferous gray copper and mispickle, with hornblend and calcspar on the foot wall. The ore is free milling and contains rich bodies of silver glance.

BLUEBIRD.—Superintendent Fleming has a force of men at work on the 150 foot level. They are extracting about 30 tons of 50-ounce ore per day from the old shaft. The vein has been crosscut about 22 feet and, so far, no foot wall discovered. In the tunnel of the Bluebird, stoping is going on with regularity and about 20 tons per day coming from the vein. This ore gives assay valuation of from 50 to 60 ounces in silver. In the new Amy shaft the workmen are down 140 feet and are crosscutting from bottom of shaft, south to tap the main vein.

THE CHAMPION.—Work is going on in the east level on very rich ore. Work on this level (the 140) has been commenced with a view of continuing for 100 feet or more, before starting in another direction. The vein is about four feet in width, and carries a considerable amount of silver, some gold and manganese, the entire body averaging from 53 to 65 dollars per ton in silver, and from four to ten dollars in gold. The ore is being hoisted regularly, and is shipped to the Moulton for reduction. The Champion lays in one of the best mining districts, near Butte, and is but a little way north of the Bluebird and Little Darling. In this mine a new body of ore has been lately reached. In drifting on the main vein a 20-foot horse was encountered, cut and exhausted. The ore body beyond proved richer than that previously encountered. The work is being driven rapidly. The company now propose to sink the shaft 100 feet deeper, and from that point run drifts and crosscuts. Ninety-one tons (the last shipment to the Moulton) gave battery assays of $46.50 ounces in silver, with about $7 in gold. The ore daily taken from this mine more than pays all expenses. Considering the fact that continual new improvements are being made this is something remarkable. The ore is sent to Moulton and Colorado for treatment. In this district other mining properties are looming up. Many owners of different claims are putting their prospects in order, erecting whims, hoisting works and making preparations for general development. Just underneath the Bluebird, on the flat, or rather in the gulch, stands the little town of Burlington, the head center of Independence district.

NEW MEXICO.

NOTES.—Silver City *Enterprise*, Feb. 26: The Arizona Copper company at Chiton is buying copper ores and giving the best price possible for them. For the four weeks ending February 7, the Carlisle company shipped $23,000 in gold bricks. This besides the concentrates is a good showing for the first month in the year. Sam Eckstine recently did his assessment on the Mule mine at Pinos Altos, and from fourteen tons of ore taken out he received $80 in gold and the concentrates are worth $33.50. Sam has commenced work on the Thicket group of mines, near Bear mountain. A party of prospectors, backed by Leadville capital, will start for the country east of the Oregon mountains, to a district believed to be rich in placer gold and formerly worked by the Jesuit Fathers. The only drawback to that section heretofore is lack of water, which is about twenty-five miles distant. The party intends to prosecute work with a dry process as well as with water. Two car loads of ore was shipped last week from Kingston to Denver. One car came out of the Black Colt and the other from the Lady Franklin, both mines being new producers, this being their first shipment. The Lady Franklin, which lies close to the Superior and Bullion, promises to be a regular producer and a paying property for her owners. The mines of Kingston are being steadily developed, and as a general proposition the result is quite satisfactory to the owners. Messrs. Lewis, Colquhoun and Rich have purchased the Silver King mine at Bald mountain, formerly owned by George Parker. This claim has been under bond for some time, and during that time has been developed enough to satisfy purchasers that it is a promising and valuable prospect. From fifty-seven sample assays recently made an average of $477 was obtained. The gentlemen interested propose continuing development work and sdipping the ore. They have a good thing. The Benson smelter company are taking out about ten tons of iron ore per day from their mine near Santa Rita. Messrs. McFarland and Alpho have the contract for doing the mining, while Bragaw & Co. haul the ore from the mine to Whitewater, from whence it is shipped by rail to Benson. When the anticipated improvements are made upon the roads between this point and Georgetown, and the gauge of the road widened, the ore from this property will probably be shipped from Silver City. Mr. Thomas J. Levy was in town this week and imparted to us some very hopeful tidings concerning the Carlisle district. He informs us that he has undoubtedly made a rich discovery on the Pilgrim mine, owned by himself and Frank and Fred Walls. This claim is on the Carlisle ledge and is an extension of the Pennsylvania mine. He and his associates sank a shaft of over 40 feet and ran a tunnel about the same distance to meet the ore body. The result developed a vein of fully 7 feet wide with well-defined wall rocks. This vein contains 5 feet of solid ore, with a foot of gangue and one foot of quartz—the latter bearing mineral of a low grade. The average of the ore in richness is double that of the Carlisle company mine. Mr. Levy says that he and his partners intend to work their claim vigorously and ship the ore. He also informs us that some very good ore has been struck on the Pennsylvania mine. It is his belief that the Carlisle camp will boom up very shortly as the richest mining district in the country.

OREGON.

PLACER MINES.—*Jacksonville Times*, Feb. 28: More rain is wanted by the miners. The miners of Josephine county are making the best of an abundant supply of water. Most of them will do well.

Charles Sanders of Galice creek was in Jacksonville this week. He says the miners of that section have an abundance of water. Keaton & Klippel of Poorman's creek have a good supply of water and are piping regularly. They expect to make a good run. The Centennial Mining Company of Willow Springs are busily at work drifting and are doing considerable work, with excellent prospects. Jack Layton of Farris gulch has an excellent supply of water and will make a paying run. He has one of the best claims in Southern Oregon. The Enterprise Mining Company of this place solicits bids for completing a shaft on their mining property recently begun by S. Bailey and F. Cimborsky. Hays & Magruder's claims on Rogue river are being run on full time and prospect excellently. The proprietors expect to open the claim thoroughly this season.

UTAH.

REVIEW.—Salt Lake *Tribune*, Feb. 27: The week has been quiet, and the mud deep, all indications favoring the idea that the winter break-up has begun, and that spring is coming on apace. No ore and bullion shipments from the city are reported for the week. The receipts of the metals have been very light. For the week ending February 25th, inclusive, the banks of this city report the receipt of $44,907 in bullion, and $11,038.04 in ore; a total of $55,942.04. For the week previous the receipts were $04,697.29, being $49,503.50 of bullion and $15,193.79 of ore. The receipts from the Ontario for the week were forty-eight bars of bullion, of the value of $31,967.00, being a total for the year of $244,575.87. The receipts from Silver Reef were as follows: From the Christy, two bars of silver, $3,200; from the Stormont, one bar, $2,100; a total of $5,300. Ore receipts were as follows: From Utah—Eureka, $5,050; Crescent, $3,300; total, $8,390. Wood River—Mayflower, $1,710; miscellaneous, $938; total, $2,648.

SILVER REEF.—Southern Utah *Times*, Feb. 28: The Christy Company is working at present five different claims, which are producing sufficient ore to keep a five-stamp mill in active opeartion night and day—crushing, on an average, 45 tons every 24 hours. The main supply of ore is now being furnished by the California and Maggie mines. The California is located on the ledge proper, taking in 1,300 feet of the vein. The Maggie is a side claim, adjoining the California on the east. The ore from this claim lies near the surface, where a portion of the ledge crops out near the California east side line. The main working shaft is an incline situated 600 feet from the north end line. A drift run north at the 400 foot level, which connects with an incline shaft on the north end of the property. It was around this shaft that the great bulk of ore was formerly extracted. Only about one-third of the ground was explored. A block of ground extending north from the main shaft 300 feet and 300 feet in hight from the 400 level is now being opened up. There has been several large chimneys and pockets of ore opened up in this portion of the mine, with every indication that the ground will pan out as well as that immedietely adjoining the north shaft. The north shaft was sunk over 500 feet, with ore in the bottom, when the mines were closed. It is not being worked below the 400 level at present, on account of water. Since the company began operations last August, much prospecting has been done in the mine. From the appearance of stopes and all indications, we think there is not a doubt but that the mill could be kept running for two years on ore in the northern part of the mine; and judging from the work already done, and the developments made in the surrounding claims, the southern 700 feet will, when properly opened up, produce as much as the northern part of the mine. The other claims worked by the Christy Company are the Storm King, Tecumseh and Silver Flat. These claims adjoin each other, and are situated on the Buckeye Reef, about a quarter of a mile from town. The working shaft, generally known as the New Shaft, is sunk vertically to a depth of 380 feet. This new shaft and hoisting works cost the Company a large amount of money, and was one of the causes which made a temporary suspension of work on the mines necessary. The properties are being opened by winzes, drifts, etc. There is considerable ore in sight in the stopes, and when in proper working order will be large producers. The Company is working sixty-five men underground and sixteen men in the mill. The mill is turning out on an average $25,000 worth of bullion per month. About one-half of the miners are engaged in prospecting and opening up the ground.

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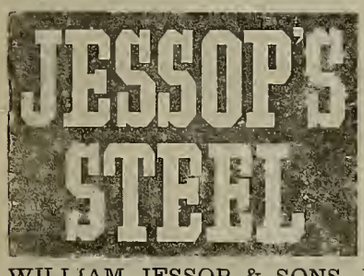

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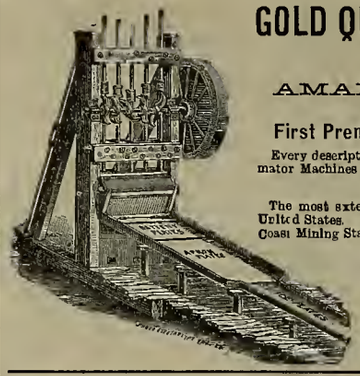

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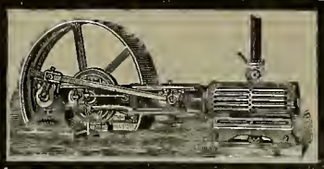

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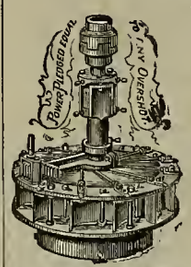

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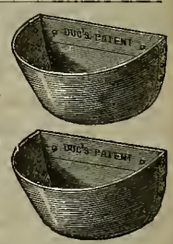

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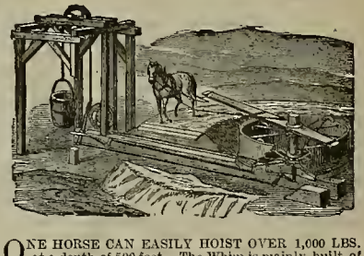

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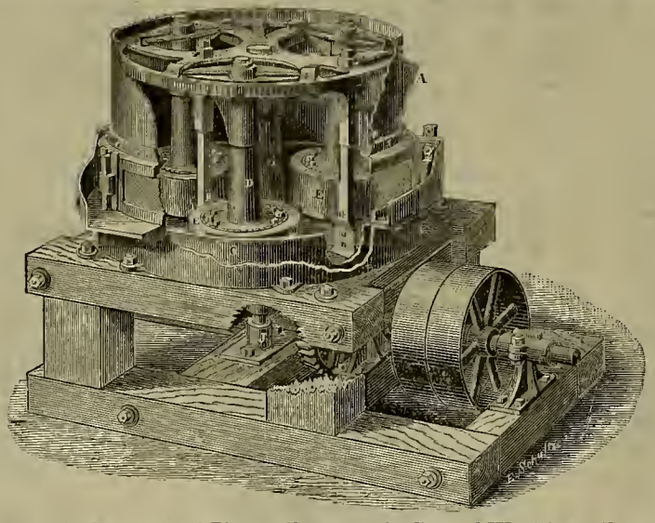

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Mining Share Market.

The principal attention of mining stock speculators is just now turned toward probable developments in Hale & Norcross, on the Comstock. An *Enterprise* reporter visited the office of the Hale & Norcross the other day, and was present when the assayer brought in his report. There had been about 25 assays made of samples taken from different parts of the crosscut on the 2,900 level, and the lowest assay was $10.80, and the highest $780. The average assay was about $35. The work is being pushed rapidly, and the crosscut was eight feet in good ore. Superintendent Keating, Morris Hoeflich, Sam Jones and Archie Borland were examining samples just brought up when the reporter made his visit, and they all seemed pleased with the prospect.

At the north end mines everything is going on as usual. They are repairing machinery at the Sierra Nevada, and have cut into the Mexican from the 500 level drift of the Ophir. Nothing is being done at the Union works on the surface, no one being employed on the top but two watchmen.

At the Gold Hill mines everything is running smoothly, and the usual amount of low-grade ore is being extracted and sent to the mills.

Bullion Shipments.

Eureka ore, Feb. 27, $2600; Ontario, 27, $16,630; Germania, March 1, $3874; 5, $7,106; Holmes, Feb. 28, $6,000; Christy, March 3, $1,450; Germania, 3, $8,163; Wood River ore, 3, $807; Stormont, 3, $1,720; Eureka ore, 3, $1,950; Crescent, 3, $7,670. Wells, Fargo & Co.'s bullion shipments from Silver Reef for the month of February aggregated $30,345.50. Ten cars of ore, valued at $233,150, and 14 cars of bullion, valued at $323,756, was the shipment from Salt Lake for last week.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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GEO. MCDOWELL—Santa Clara County.
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MRS. OZIER—Napa County.
W. H. H. HUSSEY—Contra Costa County.
C. M. CARR—Oakland.
W. B. TURNER, Los Angeles and San Bernardino Cos.
J. M. LOGAN, San Francisco.
F. W. SMITH, Arizona.
C. H. EBERLE—Alameda County

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Number 252.

We caution persons looking for our office against AN abominable irregularity in the numbering of stores in our vicinity on Market street. This office is number 252 Market street. The next doorway eastward, (towards the water front, formerly numbered "250") has recently been labeled "218." Four doors westward the number 400 appears. Across the street from us the number is 325. Remember our elevator is at No. 12 Front street, and our stairway entrance No. 252 Market street, third stairway below Front street.

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Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY TO THE LABEL ON YOUR PAPER.

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ASSESSMENTS.

COMPANY.	LOCA	N. NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Andes S M Co	Nevada	26	25	Mar 2	Apr 8	Apr 30	B Burris	309 Montgomery st
Alpha Con M Co	Nevada	19	50	Jan 20	Feb 26	Mar 21	W Willis	309 Montgomery st
Acme M and M Co	California	8	12	Jan 14	Feb 20	Mar 13	J M Buffington	309 California st
Belmont M Co	Nevada	39	15	Feb 11	Mar 21	Apr 13	J W Pew	310 Pine st
Black Bear M Co	California	2	25	Dec 20	Feb 20	Mar 17	W L Oliver	328 Montgomery st
Bulwer Con M Co	California	1	20	Jan 13	Feb 24	Mar 31	W Willis	309 Montgomery st
Butte Creek H M Co	California	11	10	Jan 30	Mar 9	Mar 31	R L Taylor	230 Montgomery st
Cueva Santa M Co	Mexico	5	25	Jan 22	Feb 27	Mar 29	W L Oliver	328 Montgomery st
Champion G M Co	California	18	10	Jan 28	Mar 6	Mar 26	T Wetzel	522 Montgomery st
Caledonia M Co	Dakota	15	15	Jan 27	Mar 9	Apr 6	W L Oliver	328 Montgomery st
Con Virginia and California	Nevada	2	20	Jan 15	Feb 20	Mar 21	A W Havens	309 Montgomery st
Eintracht Gravel M Co	California	17	05	Dec 9	Mar 3	Mar 21	H Kuntz	209 Sansome st
Exchequer M Co	Nevada	21	20	Jan 2	Mar 3	Mar 23	C C Elliott	309 Montgomery st
Golconda M Co	California	1	03	Feb 7	Mar 12	Mar 31	J M Buffington	309 California st
Golden Channel M Co	California	2	01	Feb 12	Mar 26	Apr 21	A B Paul	328 Montgomery st
Hazard G M Co	California	6	05	Jan 21	Feb 28	Mar 28	J T McGeoghegan	318 Pine st
Homeward Bound P M Co	California	3	06	Feb 21	Mar 12	Apr 6	D A Smith	209 Post st
Indian Spring Drift M Co	California	5	03	Feb 19	Mar 23	Apr 23	A B Paul	328 Montgomery st
Independence M Co	Nevada	14	13	Jan 21	Mar 2	Mar 30	J W Pew	310 Pine st
Martin White M Co	Nevada	19	25	Jan 15	Feb 25	Mar 25	J J Scoville	309 Montgomery st
Mammoth Bar M Co	California	7	10	Jan 19	Feb 20	Mar 13	J W Pew	310 Pine st
Mayflower Gravel M Co	California	28	10	Jan 20	Feb 27	Mar 20	J Morizio	328 Montgomery st
Mexican M Co	Nevada	29	25	Feb 24	Mar 31	Apr 21	C E Elliott	309 Montgomery st
North Banner Tunnel Co	California	6	4c	Feb 7	Mar 13	Apr 7	T J Mitchell	Grass Valley
Ophir M Co	Nevada	49	50	Feb 18	Mar 24	Apr 13	E B Holmes	309 Montgomery st
Peer M Co	Arizona	2	50	Jan 14	Feb 19	Mar 16	A Waterman	309 Montgomery st
Peerless M Co	Arizona	3	50	Jan 14	Feb 18	Mar 14	A Waterman	309 Montgomery st
Potosi M Co	Nevada	17	25	Jan 27	Mar 2	Mar 24	C L McCoy	309 Montgomery st
Rocky Bar M Co	California	8	25	Feb 19	Mar 24	Apr 13	G W Hill	Grass Valley
Sulphur Bank Q M Co	California	3	50	Feb 25	Apr 16	Jun 1	L Hermann	220 Sansome st
Savage M Co	Nevada	62	50	Feb 2	Mar 6	Mar 26	E B Holmes	309 Montgomery st
Silver Hill M Co	Nevada	21	15	Jan 9	Feb 13	Mar 6	W E Dean	309 Montgomery st
Sierra Nevada M Co	Nevada	81	25	Feb 18	Mar 25	Apr 14	E S Parker	309 Montgomery st
Union Con M Co	Nevada	23	25	Feb 16	Mar 24	Apr 14	J M Buffington	309 California st
Yosemite M Co	California	2	25	Feb 7	Mar 16	Apr 21	J Weisheim	Grass Valley

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Anglo-Mexican M Co	Mexico	C A Morse	217 Sansome st	Annual	Mar 10
Melones Con M Co	California	E M Hall	327 Pine st	Annual	Mar 24
Potosi M Co	Nevada	C L McCoy	309 Montgomery st	Annual	Mar 11
Sierra Nevada M Co	Nevada	J L Fields	330 Pine st	Annual	Mar 17
Virginia Con M Co	Nevada	A F Bernard	864 Howard st	Annual	Mar 16
Ward G M Co	California	E M Hall	327 Pine st	Annual	Mar 19

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	B L Burling	328 Montgomery st	50	Dec 5
Coutention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Dec 15
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Oct 8
Jackson M Co	California	D C Bates	309 Montgomery st	10	Dec 27
Kossuth M Co	Nevada	C K Sturtevant	328 Montgomery st	06	Mar 16
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Feb 13
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Nov 28
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Feb 16
Syndicate M Co	California	J Stadfeldt	419 California st	10	Nov 6

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Feb. 12.		WEEK ENDING Feb. 19.		WEEK ENDING Feb. 26		WEEK ENDING Mar. 5.	
Alpha	....	....	....	.20	.60	.65	.60	.75
Alta	.25	.30	.30	.40	.25	.45	.25	.30
Andes	....	.10	....	....	....	.10	.11	.25
Argenta	....	....	....	....	....	....	....	....
Belcher	....	....	....	....	....	.70	....	.70
Belding	....	....	....	....	....	....	....	....
Best & Belcher	.70	.80	.70	.75	.50	.90	.50	1.25
Bullion	.20	.25	....	.25	....	.25	....	.25
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	.15	....	....	....	....	....	....	.20
Bodie Con	1.85	2.15	1.95	2.05	2.00	2.10	2.15	2.65
Benton	....	.05	.05	.10	....	.10	.05	.10
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	....	.05	.05	.30	.25	.30	.25	.35
California	....	.10	.10	.30	.25	.30	.25	.60
Challenge	....	.15	....	....	.15	....	....	....
Champion	....	....	....	....	....	....	....	....
Chollar	2.00	2.65	2.60	3.00	2.50	2.80	2.05	2.80
Confidence	....	....	....	....	....	....	....	.75
Coo. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	....	.10	.10	.30	.25	.30	.25	.60
Con. Pacific	.25	.75	.70	.85	.90	.95	....	.95
Crown Point	.80	.65	....	.85	.75	.80	.80	1.05
Day	....	....	....	....	....	....	....	....
Eureka Con	....	....	....	2.75	....	....	....	....
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	....	....	....	....	....	....	20	25
Grand Prize	....	....	....	....	....	....	....	....
Gould & Curry	.65	.70	.60	.65	.50	.75	.50	1.00
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	3.40	4.05	3.65	4.35	3.70	5.50	3.85	5.35
Holmes	4.70	5.00	4.50	4.60	....	4.60	....	4.60
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	....	....	....	....	.15	....	....	....
Martin White	....	....	.15	.45	....	.45	.50	1.35
Mono	1.00	1.70	1.25	1.35	1.35	1.50	1.35	1.55
Mexican	....	.30	.25	.30	....	.20	.20	.40
Mt. Diablo	....	3.50	....	....	....	....	....	....
Northern Belle	....	....	....	....	....	....	....	....
Navajo	1.30	1.40	1.00	1.40	....	1.05	1.05	1.20
North Belle Isle	....	.15	....	.15	....	.15	....	.20
Occidental	.75	.80	....	.85	....	.85	....	1.00
Ophir	.30	.85	....	.30	.10	.15	.20	.80
Overman	.10	.20	....	.20	....	.15	.20	.80
Potosi	.65	.80	.75	.90	.75	.80	.75	1.05
Pinal Con	....	....	....	....	....	....	....	....
Savage	.90	1.00	.90	1.00	.90	1.00	.95	1.50
Seg. Belcher	.75	1.10	....	1.25	....	....	....	....
Sierra Nevada	.35	.45	....	.30	.15	.20	.20	.40
Silver Hill	....	.10	....	.10	....	....	....	....
Silver King	....	....	....	....	....	....	....	....
Scorpion	....	....	....	.10	....	.10	....	.10
Syndicate	....	.40	....	.40	.35	.40	.45	.50
Tioga	....	....	....	....	....	....	....	....
Union Con	.35	.40	.25	.35	.20	.30	.25	.40
Uta	....	....	....	.45	.35	.40	.45	1.00
Yellow Jacket	1.20	1.25	1.20	1.25	1.20	1.30	1.20	1.30
....	....	....	....	....	....	....	....	....

Lost Papers.

If any subscriber fails to receive this paper promptly, after making due inquiries at the Postoffice, he is urgently requested to notify this office by *letter*, that we may send the missing papers, and, if possible, guard against further irregularities.

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Mar. 7.

40 Alpha 70c
200 Bodie Con .....2.40@2.45
410 B. & Belcher .....1.05@1.10
250 Belcher 70c
350 Chollar .....2.30@2.35
100 Con Va & Cal 90c
150 Con. Pacific 1.00
300 Gould & Curry .....85@90c
610 Hale & Nor 55
200 Mono 1.40
250 Navajo 1.10
90 Occidental .....80@81.00
100 Potosi 1.00
50 Sierra Nevada 35c
950 Savage 1.85

AFTERNOON SESSION.

50 Alta 30c
820 Andes 15c
165 B. & Belcher 1.10
100 Bodie 2.40
450 Chollar 2.15
701 Con Va & Cal 40c
50 Grand Prize 40c
400 Gould & Curry .....80@85c
550 Hale & Nor 4.85
80 Mexican 35c
300 Navajo 1.10
200 N. Belle Is 20c
100 Ophir 25c
100 Potosi 1.00
200 Sierra Nevada .....35@40c
140 Savage .....1.20@1.25
70 Syndicate 50c
50 Union Con 20c

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Mar. 5, 1885.

ANTIMONY—Per pound	@	
Hallet's	12½@	—
Cookson's	13 @	—
BORAX—Refined	7 @	8
IRON—Glengarnock ton	23 50 @	—
Eglinton, ton	22 50 @	—
American Soft, ton	27 00 @	—
Oregon Pig, ton	@	—
Clipper Gap, Nos. 1 to 4	25 00 @	30 00
Clay Lane White	26 00 @	—
Shotts, No. 1	26 00 @	—
STEEL—English, ₱	16 @	25
Black Diamond, ordinary sizes	13 @	—
Plow	6 @	8
Machinery	10 @	12
Sanderson Bros	13 @	—
COPPER—		
Braziers' sizes	— @	25
Fire-box sheets	28 @	—
Bolt	22 @	—
Yellow Metal	14 @	15
LEAD—Pig	3½@	3¾
Bar	5 @	—
Pipe	7 @	—
Sheet	8 @	—
Shot, discount 10% on 500 bag	Drop, ₱ bag. 1 85 @	—
Buck, ₱ bag	2 05 @	—
Chilled, do	2 25 @	—
TINPLATE—Oldcastle	5 25 @	6 00
Charcoal	5 75 @	6 50
Coke	5 25 @	5 50
Roofing	6 25 @	13 50
ZINC—German	9 @	10
Sheet, 7x3 ft, 7 to 10 ₱, less the cask	9 @	10
QUICKSILVER—By the flask	33 50	
Flasks, new	1 05 @	—
Flasks, old	85 @	—
NEW YORK PRICES—		
California Borax, refined	8 @	8½
Pig Iron, American No. 1	17 50 @	18 50
Quicksilver	47½@	—
Lead	3 62½@	3 75
Copper	3 60 @	3 70
Tin	17½@	—
Bar Silver	1 06½@	—

THE thermometer at the horax works at Death valley is said to have marked 120 degrees in the shade at mid-day one day last week.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & CO.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING FEBRUARY, 24, 1885.

312,948.—RECTIFYING LIQUORS BY ELECTRICITY—Thos. Atkinson, S. F.

312,709.—VARIABLE ECCENTRIC—W. H. DeValin, San Rafael, Cal.

312,623.—ROLLER MILL—F. Ferrier, Vallejo, Cal.

312,784.—FIRE ESCAPE—Z. LUDWIG—Oakland, Cal.

312,649.—REVERSIBLE PLOW—C. Myers, S. F.

312,671.—CHURN—W. H. Tambling, S. F.

312,672.—BOLTING REEL—A. J. Terry, S. F.

312,775.—SPRING SEAT—Robt. Walker, Oakland, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

HOSE PATCH.—Geo. W. Towle, Jr., San Rafael, No. 312,406. Dated Feb. 17, 1885. This invention relates to the class of hose patches in which a sheet, strip or plate of suitable material—such as brass or other sheet metal—is made to encircle the hose and cover the break or slit. The invention consists in an improved arrangement of the devices on the patch, whether on the slit or tongue side, with which the tool or implement for clamping or seating it firmly in its place engages, and is an improvement on the fastening devices by which it is permanently fixed.

ARTIFICIAL LEG CORD.—Menzo Spring, S. F. No. 312,396. Dated Feb. 17, 1885. This invention relates to an improved cord which joins the foot to the leg portion of artificial legs; and the invention consists in a peculiarly plaited or braided outer covering or casing for the body or core of the cord, and in the connection between the top of the cord and the screw. The object of the invention is to provide a casing for the body or core of the cord, which by being plaited or braided is not only adapted to resist the twisting strain, but will even tighten on itself, and cannot become rigid or stiff as the nut is turned in either direction, forward or back; and the further object is to provide a simple and effective connection between the top of the cord and the screw.

SPRING SEAT, Robert Walker, Oakland, No. 312,775. Dated Feb. 24, 1885. This is a combination of springs and levers which is especially applicable in the construction of seats, and form an improvement on a previously patented device by the same inventor. The improvement consists of eight levers or arms, which may extend from each corner of the seat supported by them to a central point, where a single joint similar to that of tongs is made, so that all eight arms branch outwardly from this joint, four being above and four below the joint. Between each upper and lower pair of arms a spring is inserted whereby the vertical movements of the seat are equalized without reference to the position of the weight upon the seat. It further consists of an adjustable hack-piece for the seat, and to certain details of construction.

NOTICE

Is hereby given that a meeting of the stockholders of the Lord of Lorn Gold and Silver Mining Company (a corporation) will be held on the 11th day of May, A. D. 1885, at one o'clock P. M., at the office of said corporation, in room No. 6, in building No. 318 Pine street, in the City and County of San Francisco, California, for the purpose and with the object: First, of increasing the capital stock of said corporation, so that the whole amount or par value thereof shall be $10,800,000, divided into 108,000 shares of the par value of $100 each; and, Second, to repeal the by-laws of said corporation, or any part thereof, and to amend the by-laws, or to adopt new by-laws therefor, as said meeting may determine. By order of the Board of Directors and Trustees, and of the President. March 7, 1885. JAS. T. MCDOUGALL, President.

R. N. VAN BRUNT, Secretary.

Engraving Superior Wood and Metal Engraving, Electrotyping and Stereotyping done at the office of the MINING AND SCIENTIFIC PRESS, San Francisco, at favorable rates.

NOTICE TO MINING MEN!

SILVER PLATED AMALGAMATING PLATES FOR SAVING GOLD.

Gold Medal Awarded.

FULL WEIGHT IN SILVER GUARATEED.

All Plates Assayed by one of our most able Assayers, C. A. LUCKHARDT.

GET OUR PRICES BEFORE ORDERING ELSEWHERE.

CHICAGO PLATING COMPANY, 21 Stevenson Street.

JUSTINIAN CAIRE, Dealer in Mining Material, Agent, 521 and 523 Market St, San Francisco, Cal.

DELINQUENT NOTICE.

Fremont Mining and Milling Company.—Location of principal place of business, San Francisco, California. Location of works, Amador county, near Drytown, California.

NOTICE. There are delinquent, upon the following described stock, on account of Assessment (No. 1) levied on the twenty-ninth day of December, 1884, the several amount set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Ames, D W	231	100	$10 00
Ames, D W	696	25	2 50
Adams, Jas L	171	20	2 00
Adams, Edward S	524	20	2 00
Adams, Catherine S	662	15	1 50
Adams, Catherine S	663	10	1 00
Adams, Mrs Susan S	668	10	1 00
Arnsby, Ella	1005	5	50
Atkins, Eliza B	122	40	4 00
Atkins, Eliza B	981	10	1 00
Atkins, J C	375	50	5 00
Averill, C W	610	25	2 50
Averill, C W	950	50	5 00
Averill, Charles W	377	50	5 00
Averill, Charles W	633	25	2 50
Bartlett, Wm M	326	25	2 50
Bartlett, John C	325	25	2 50
Bartlett, John C	817	100	10 00
Bacon, Dan'l H	939	10	1 00
Bisbee, H R	34	100	10 00
Blanchard, O M	215	20	2 00
Bliss, Samuel	250	100	10 00
Bliss, Samuel	900	100	10 00
Bliss, Samuel	1106	50	5 00
Bridges, F W	674	50	5 00
Bridges, F W	675	50	5 00
Bailey, Clara E	689	10	1 00
Bailey, Cloora E	453	10	1 00
Bailey, Charles W	578	10	1 00
Bailey, Charles W	703	10	1 00
Bailey L	506	20	2 00
Berry, Flora R	1071	6	60
Berry, William R	1072	2	20
Berry, Martin W	1073	2	20
Brooks, J Henry	677	100	10 00
Brooks, Walter D	678	50	5 00
Brooks, John W	1161	50	5 00
Brown, Moses T	573	25	2 50
Brown, Moses T	845	50	5 00
Brown, Moses T	659	50	5 00
Brown, Moses T	740	75	7 50
Buffum, A K P	366	50	5 00
Buffum, A K P	647	50	5 00
Cardwell, S A	261	20	2 00
Cardwell, S A	320	20	2 00
Cardwell, S A	581	10	1 00
Cardwell, S A	1118	20	2 00
Cardwell, A A	520	10	1 00
Cloudman, Frank H	891	10	1 00
Cloudman, Frank A	892	5	50
Clark, Josh H	1086	25	2 50
Cooke, L D	178	20	2 00
Cooke, L D	220	50	5 00
Crowell, E G	587	25	2 50
Coney, G A	601	125	12 50
Coney, G A	743	25	2 50
Coney, G A	934	50	5 00
Coney, Annie E	603	15	1 50
Coney, Anginette	671	12	1 20
Coney, Horace	462	25	2 50
Coney, Horace	463	25	2 50
Coney, Horace	602	50	5 00
Day, Mrs Wm H	718	25	2 50
Day, Wilbur F	201	20	2 00
Day, Wilbur F	408	30	3 00
Day, Wilbur F	557	50	5 00
Day, Wilbur F	689	20	2 00
Day, Wilbur F	1103	20	2 00
Day, Wilbur F	1146	25	2 50
Dennis, Alice	448	10	1 00
Dennis, Alice M	89	10	1 00
Dennis, Susan L	90	50	5 00
Dennis, Susan L	91	60	5 00
Dennis, Susan D	92	50	5 00
Dennis, Fannie	94	10	1 00
Dennis, Susan	95	10	1 00
Dennis, Delia H	97	30	3 00
Dennis, Delia H	372	20	2 00
Dennis, Delia H	1160	150	15 00
Dennis, J C	371	100	10 00
Dennis, David	329	50	5 00
Dennis, David	1011	100	10 00
Dennis, Henry	535	50	5 00
Dennis, E	98	30	3 00
Dennis, E	454	50	5 00
Dennis, John	455	50	5 00
Dennis, John	456	50	5 00
Dewey, H P	433	50	5 00
Dewey, H P	435	25	2 50
Dewey, H P	436	25	2 50
Dewey, H P	437	25	2 50
Dewey, H P	438	25	2 50
Dewey, H P	959	100	10 00
Dill, Fred W	778	50	5 00
Dill, Orrison	562	50	5 00
Dill, Orrison	563	50	5 00
Dill, Orrison	958	30	3 00
Douglass, Joseph	991	50	5 00
Douglass, Joseph	992	25	2 50
Douglass, Geo W	973	50	5 00
Douglass, Geo W	974	50	5 00
Dorman, Charles D	680	50	5 00
Dorman, Charles D	681	25	2 50
Dorman, James W	682	50	5 00
Drew, J P	38	25	2 50
Drew, J P	39	25	2 50
Drew, J P	40	25	2 50
Drew, J P	41	25	2 50
Drew, J P	42	50	5 00
Drew, J P	43	50	5 00
Drew, J P	223	100	10 00
Drew, J P	402	100	10 00
Drew, J P	403	25	2 50
Drew, J P	404	25	2 50
Drew, J P	405	25	2 50
Drew, J P	805	10	1 00
Drew, Mrs J P	947	25	2 50
Drew, Nellie A	616	25	2 50
Durein, John	1087	25	2 50
Dunnell, Joseph	1010	40	4 00
Dyer, S C	1088	100	10 00
Dyer, S C	1089	100	10 00
Dyer, D W, Executrix	443	15	1 50
Dyer, D W, Executrix	444	15	1 50
Elwell, F M	232	25	2 50
Elwell, F M	1057	25	2 50
Evans, E H	739	10	1 00
Fellows, Jabez B	739	50	5 00
Field, Sarah C	574	25	2 50
Field, Sarah C	646	50	5 00
Field, Sarah C	658	50	5 00
Foy, John K	202	10	1 00
Foy, John K	203	10	1 00
Foy, John K	482	20	2 00
Foy, John K	552	100	10 00
Foy, John K	553	100	10 00
Foy, John K	1019	50	5 00
Foy, John K	1095	25	2 50
Foy, John K	1096	25	2 50
Foy, John K	1097	25	2 50
Foy, C W	169	50	5 00
Foy, C W	259	50	5 00
Foy, G W	521	80	8 00
Foy, C W	701	10	1 00
Foy, C W	804	50	5 00
Foy, Harriet K	345	20	2 00
Foy, Harriet K	350	30	3 00
Fuller, W F	1149	50	5 00
Gates, Mary E	917	20	2 00
Globons, Wm P	1111	100	10 00
Goding, E L	127	50	5 00
Goding, E L	510	40	4 00
Goding, E L	618	35	3 50
Goding, E L	647	50	5 00
Goding, E L	779	100	10 00
Goding, E L	780	100	10 00
Goding, E L	781	25	2 50
Goding, E L	1098	50	5 00
Goding, E L	1099	50	5 00
Goding, Edwin G	1162	50	5 00
Goding, E	511	40	4 00
Goding, E	619	20	2 00
Goding, E	650	50	5 00
Goding, E	651	50	5 00
Goding, H F	128	10	1 00
Goding, Henry F	1008	20	2 00
Goodrich, Geo R	197	25	2 50
Goodrich Geo B	130	25	2 50
Goodrich, Geo B	418	50	5 00
Goodrich, Geo B	874	15	1 50
Goodrich, S S	419	25	2 50
Goodrich, S S	420	50	5 00
Goodrich, S S	641	50	5 00
Goodrich, S S	935	50	5 00
Goodrich, Samuel S	108	75	7 50
Goodrich, Jacob W	441	25	2 50
Goodrich, Jacob W	152	50	5 00
Gray, Edwin A	34	25	2 50
Gray, Edwin A	1157	25	2 50
Gorrie, Thomas	459	12	1 20
Gorrie, Thomas	653	13	1 30
Gorrie, Thomas	660	10	1 00
Gorrie, Thomas	940	10	1 00
Graves, Mrs Adelaide	841	25	2 50
Graves, Mrs Adelaide	842	25	2 50
Graves, Mrs Adelaide	843	25	2 50
Grant, Peter	1177	20	2 00
Grant, Peter	1178	50	5 00
Grant, Peter	1179	100	10 00
Grant, Peter	1180	100	10 00
Grant, Peter	1181	100	10 00
Grant, Peter	1182	100	10 00
Grant, Peter	1183	100	10 00
Grant, Peter	1184	100	10 00
Grant, Peter	1184½	500	50 00
Grant, Peter	1185	500	50 00
Gray, E A	814	25	2 50
Grant, R H	580	20	2 00
Harper, J W	740	10	1 00
Harley, D F	865	50	5 00
Harley, D F	866	50	5 00
Hathaway, Geo E	877	25	2 50
Hathaway, Geo E	930	10	1 00
Hathaway, Geo	907	5	50
Hildreth, Anna W	710	15	1 50
Hildreth, Anna W	1060	5	50
Hildreth, Horace W	1033	50	5 00
Hayes, R T	76	25	2 50
Hayes, R T	77	25	2 50
Hayes, R T	373	50	5 00
Hayes, R T	960	50	5 00
Horn, James	1102	100	10 00
Hodsdon, Joseph Y	634	25	2 50
Hodsdon, Joseph V	635	25	2 50
Hodsdon, Joseph Y	636	25	2 50
Hodsdon, Joseph Y	893	125	12 50
Howland, James M	883	30	3 00
Huntington, Samuel L	925	25	2 50
Hussey, C H	897	5	50
Hussey, Robt	896	5	50
Jarvis, R M	733	100	10 00
Jack, Thomas S	631	50	5 00
Jack, Thomas S	737	50	5 00
Jarvis, H N	597	5	50
Jarvis, W H S	598	5	50
Jarvis, Elvira	590	40	4 00
Jarvis, Elvira	1063	50	5 00
Jarvis, Elvira	1064	50	5 00
Jarvis, Elvira	1065	25	2 50
Jewett, Thankful H	213	40	4 00
Jewett, Thankful H	962	10	1 00
Jewett, James	971	50	5 00
Jewett, Thomas A	121	40	4 00
Jewett, Thomas A	972	10	1 00
Jewett, Harriet A	123	40	4 00
Jewett, Harriet A	600	10	1 00
Jewett, Arthur	839	30	3 00
Johnson, George N	446	25	2 50
Johnson, George N	447	25	2 50
Johnson, F A	980	50	5 00
Jordan, Geo E	875	20	2 00
Jordan, Harriet	347	20	2 00
Jose, Charles E	13	25	2 50
Jose, Charles E	14	25	2 50
Jose, Charles E	15	25	2 50
Jose, Charles E	16	25	2 50
Jose, Charles E	17	100	10 00
Jose, Charles E	208	100	10 00
Jose, Charles E	354	100	10 00
Jose, Charles E	355	100	10 00
Jose, Charles E	356	100	10 00
Jose, Charles E	357	100	10 00
Jose, Charles E	358	100	10 00
Jose, H N	542	50	5 00
Jose, H N	543	50	5 00
Jose, H N	545	50	5 00
Judkins, H E	1080	10	1 00
Judkins, H E	1117	10	1 00
Judkins, H E	1152	25	2 50
Judkins, H C	1093	5	50
Kalley, J N	769	50	5 00
Kelsey, Samuel B	901	100	10 00
Knowlton, H & W J	507	25	2 50
Knowlton, H & W J	508	25	2 50
Landers, H P	867	20	2 00
Lennan, H H	58	25	2 50
Lennan, H H	50	25	2 50
Lennan, H H	328	50	5 00
Lennan, H H	477	50	5 00
Lennan, H H	576	50	5 00
Lennan, H H	1153	100	10 00
Lennan, L	60	25	2 50
Lennan, L	617	25	2 50
Lennan, Lewellyn	327	50	5 00
Lennan, Lewellyn	717	25	2 50
Lennan, Lewellyn	951	50	5 00
Lennan, Lewellyn	981	25	2 50
Leighton, Geo W	254	50	5 00
Leighton, Geo W	702	10	1 00
Leighton, Alvin	710	15	1 50
Leighton, Alvin	1060	5	50
Lincoln, J R	378	50	5 00
Lincoln, J R	603	25	2 50
Lincoln, J R	632	25	2 50
Lincoln, J R	1107	100	10 00
Lincoln, Angeline	348	20	2 00
Lincoln, Angeline	599	30	3 00
Lord, Sarah B	734	20	2 00
Lord, Sarah B	807	10	1 00
Lord, Dan'l B	820	20	2 00
Lord, Charles A	797	50	5 00
Lord, Charles A	898	10	1 00
Longfellow & Sanborn	638	50	5 00
Longfellow, A G	725	20	2 00
Longfellow, A G	757	25	2 50
Lyon, N P	1045	25	2 50
Maginnis, D J	684	25	2 50
Mace, C W	758	10	1 00
Maxey, Louisa	1156	40	4 00
Maxey, Josiah S	694	25	2 50
Maxey, Josiah S	695	25	2 50
Maxey, Josiah S	977	50	5 00
Maxey, Josiah S	978	50	5 00
Maxey, Josiah	73	50	5 00
Maxey, Josiah	74	25	2 50
Maxey, Josiah	75	25	2 50
Maxey, Josiah	465	50	5 00
Maxey, Josiah	466	25	2 50
Maxey, Josiah	515	50	5 00
Maxey, Josiah	516	25	2 50
Maxey, Josiah	517	25	2 50
Maxey, Josiah	518	25	2 50
Maxey, Josiah	979	50	5 00
Maxey, S N	500	10	1 00
Maxey, S N	501	10	1 00
Maxey, S N	522	100	10 00
Maxey, S N	523	100	10 00
Maxey, S N	614	200	20 00
Maxey, S N	673	200	20 00
Maxey, S N	841	10	1 00
Maxey, S N	983	100	10 00
Maxey, S N	1143	25	2 50
Maxey, Ruel S	18	25	2 50
Maxey, Ruel S	19	25	2 50
Maxey, Ruel S	20	25	2 50
Maxey, Ruel S	21	25	2 50
Maxey, Ruel S	22	100	10 00
Maxey, Ruel S	227	100	10 00
Maxey, Ruel L	359	100	10 00
Maxey, Ruel S	490	10	1 00
Maxey, Ruel S	524	100	10 00
Maxey, Ruel S	786	200	20 00
Maxey, Ruel S	1040	25	2 50
Maxey, Ruel S	1052	25	2 50
Maxey, Ruel S	1116	25	2 50
Maxey, Ruel S	1142	25	2 50
McAfee, William	664	100	10 00
Mead, L G	904	50	5 00
Mitchell, Curtis	318	20	2 00
Mitchell, Josephine	530	15	1 50
Mitchell, Jos L	175	25	2 50
Mitchell, Jos L	214	10	1 00
Mitchell, Jos L	607	5	50
Mitchell, Jos L	882	30	3 00
Mitchell, Jos L	904	30	3 00
Mitchell, Jos L	1012	50	5 00
Mitchell, Mrs J L	531	15	1 50
Morrill, Walter H	1105	10	1 00
Morse, Benj J	424	25	2 50
Morse, W W	423	40	4 00
Morse, W W	726	10	1 00
Morse, W W	924	25	2 50
Morse, B F	912	15	1 50
Moore, Henry	473	50	5 00
Moore, Henry	474	50	5 00
Morse, L Francis	670	10	1 00
Morse, L Francis	719	10	1 00
McDonald, James W	35	25	2 50
McDonald, James W	99	25	2 50
Nason, Charles	913	10	1 00
Ni kolds, Mrs L C	775	15	1 50
Nickolds, Mrs L C	945	10	1 00
Osgood, J K	879	10	1 00
Palmer, J S	539	50	5 00
Palmer, J S	540	50	5 00
Palmer, J S	731	100	10 00
Plaisted, F A	63	50	5 00
Plaisted, F A	165	50	5 00
Plaisted, F A	764	100	10 00
Plaisted, F A	765	50	5 00
Plaisted, F A	782	60	6 00
Pierce, S G	1139	20	2 00
Partridge, Charles H	829	25	2 50
Partridge, Charles H	830	25	2 50
Phillips, W F	1108	100	10 00
Phillips, W F	1128	100	10 00
Phillips, W F	1129	50	5 00
Phillips, W F	1130	50	5 00
Phillips, W F	1131	50	5 00
Phillips, W F	1132	50	5 00
Phillips, W F	1133	50	5 00
Phillips, W F	1134	50	5 00
Phillips, W F	1135	50	5 00
Phillips, W F	1136	50	5 00
Potter, James E	697	25	2 50
Pratt, Freeman	1158	25	2 50
Preble, Edward E	1154	100	10 00
Preble, Hiram	166	10	1 00
Preble, Hiram	412	10	1 00
Prince, Charles	249	50	5 00
Prince, Charles	300	50	5 00
Prince, Charles	560	50	5 00
Prince, Charles	561	10	1 00
Prince, Charles	916	40	4 00
Ray, George H	471	50	5 00
Ray, George H	815	25	2 50
Ray, George H	1021	25	2 50
Richards, John T	107	100	10 00
Richards, John T	108	100	10 00
Richardson, O	1058	15	1 50
Read, Geo W	586	20	2 00
Reynolds, Mrs Frances	672	13	1 30
Robinson, E C	27	10	1 00
Robinson, E C	28	10	1 00
Robinson, E C	29	10	1 00
Robinson, E C	30	10	1 00
Robinson, E C	31	10	1 00
Robinson, E C	445	20	2 00
Rogers, Geo L	174	20	2 00
Rogers, S W	831	10	1 00
Russell, F H	709	10	1 00
Russell, F H	755	10	1 00
Russell, F H	868	10	1 00
Russell, F H	1046	10	1 00
Sands, Mary A	1022	10	1 00
Sawyer, John E	32	25	2 50
Sawyer, E A	310	100	10 00
Sawyer, J E	449	25	2 50
Sawyer, J E	450	50	5 00
Seabury, R B	62	25	2 50
Sewall, Merrill	82	50	5 00
Sewall, Merrill	83	50	5 00
Sewall, Merrill	230	100	10 00
Sewall, Merrill	331	50	5 00
Sewall, Merrill	417	30	3 00
Sewall, Merrill	736	70	7 00
Sewall, Merrill	805	50	5 00
Sewall, Merrill, Trustee	688	300	30 00
Sewall, S J	130	50	5 00
Sewall, S J	242	50	5 00
Sewall, S J	569	50	5 00
Sewall, S J	570	50	5 00
Small, John C	23	25	2 50
Small, John C	24	25	2 50
Small, John C	25	25	2 50
Small, John C	26	25	2 50
Small, John C	439	100	10 00
Small, John C	441	50	5 00
Small, John C	442	50	5 00
Spear, T H	78	25	2 50
Spear, T H	70	25	2 50
Spear, T H	80	25	2 50
Spear, T H	81	25	2 50
Swett, E C	210	100	10 00
Swett, E C	317	80	8 00
Swett, E C	700	10	1 00
Swett, E C	805	50	5 00
Scribner, Harvey	1023	50	5 00
Shaw, A W	200	30	3 00
Shaw, A W	312	20	2 00
Shaw, A W	729	10	1 00
Sewall, Mary W	245	100	10 00
Smith, Chas F	904	100	10 00
Spiers, James	660	100	10 00
Sturdevant, Cyrus	247	10	1 00
Swift, John L	1147	50	5 00
Swift, Charles	36	25	2 50
Swift, Charles	37	25	2 50
Swift, Charles	365	100	10 00
Swift, Charles	367	25	2 50
Swift, Charles	368	25	2 50
Swift, Charles	369	25	2 50
Swift, Charles	370	25	2 50
Swift, Charles	484	50	5 00
Swift, Charles	485	50	5 00
Swift, Charles	559	50	5 00
Swift, Charles	1141	50	5 00
Swift, Charles	1143	50	5 00
Sawyer, W	502	20	2 00
Sawyer, Abel H	720	10	1 00
Sewall, L D	548	50	5 00
Sewall, L D	549	50	5 00
Snow, Evander G	750	50	5 00
Snow, Evander G	1151	50	5 00
Stanwood, Arthur G	679	10	1 00
Spear, Thaddeus	513	100	10 00
Storer, Frederick	705	200	20 00
Storer, Frederick	907	100	10 00
Storer, Frederick	908	100	10 00
Storer, Frederick	909	100	10 00
Storer, Frederick	910	100	10 00
Storer, Frederick	911	100	10 00
Storer, Frederick	1127	275	27 50
Storer, Frederick	1144	25	2 50
Thurston, Stephen B	475	50	5 00
Thompson, Cyrus	1044	20	2 00
Thompson, Cyrus	1045	20	2 00
Tobey, Phineas S	683	10	1 00
Thompson, Alfred H	1110	5	50
Verrill, A	519	10	1 00
Wakefield, William O	585	20	2 00
Way, A S	744	5	50
Williams, George A	588	25	2 50
Winter, E S	313	100	10 00
Winter, Fred G	870	10	1 00
Winter, Amos G	787	10	1 00
Winter, Ethe M	788	10	1 00
Winter, Lettie	789	10	1 00
Winter, Everett	790	10	1 00
Wood, E C	173	20	2 00
Wood, E C	344	55	5 50
Wood, E C	880	50	5 00
Wood, E C	1003	50	5 00
Woodman, R D	698	10	1 00
Woodbury, George E	1104	20	2 00
Woodbury, George E	1112	10	1 00
Woodbury, George E	1115	10	1 00
Woodbury, George E	1120	10	1 00
Wood, Myranda R	592	50	5 00
Wood, Ray T	44	50	5 00
Wood, Ray T	45	50	5 00
Wood, Ray T	235	100	10 00
Wood, Ray T	321	100	10 00
Wood, Ray T	556	50	5 00
Wood, Ray T	572	50	5 00
Wood, Ray T	1145	25	2 50
York, J S	411	50	5 00

And in accordance with law, and an order of the Board of Directors, made on the twenty-ninth day of December, 1884 so many shares of each parcel of such stock as may be necessary, will be sold at public auction at the office of the company, No. 402 Front Street, room 8, San Francisco, California, on Friday the twentieth day of March, 1885 at the hour of 12 o'clock, M., of such day, to pay delinquent assessments thereon, together with costs of advertising and expenses of the sale.

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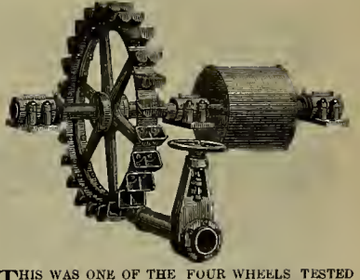

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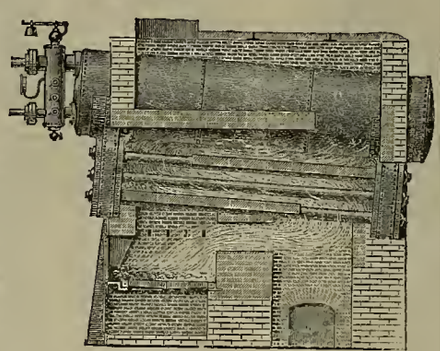
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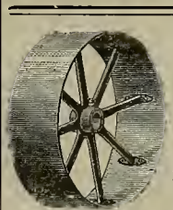
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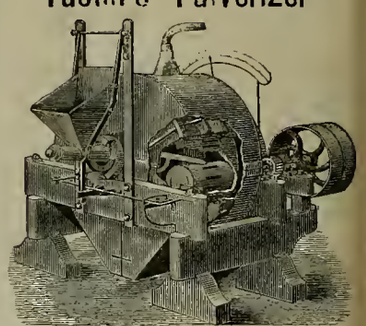
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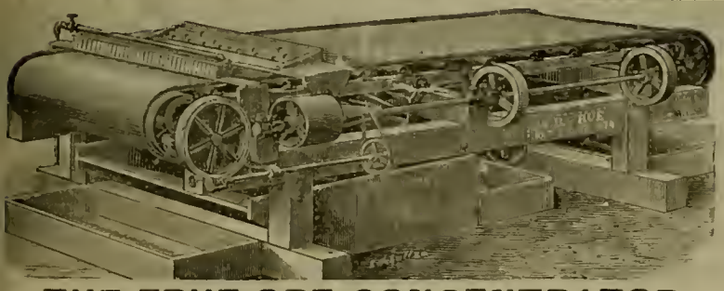

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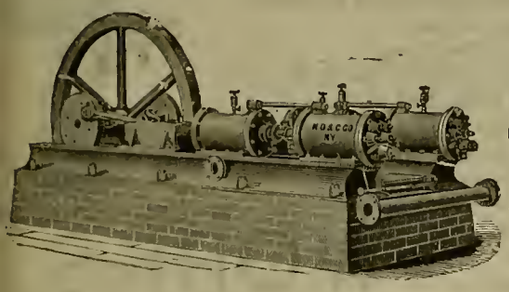

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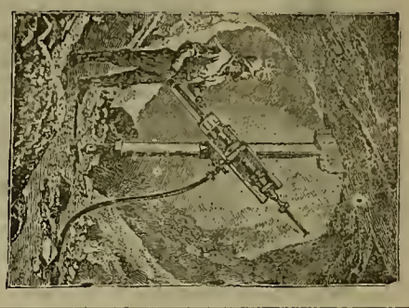

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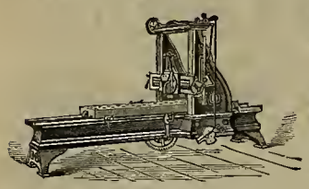

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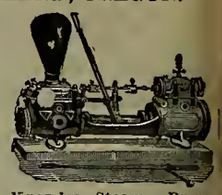

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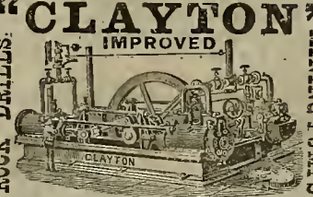

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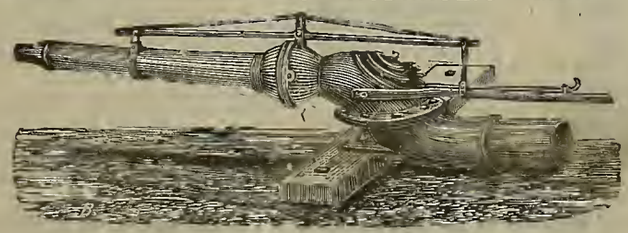

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, MARCH 14, 1885.

VOLUME XLXX Number 11.

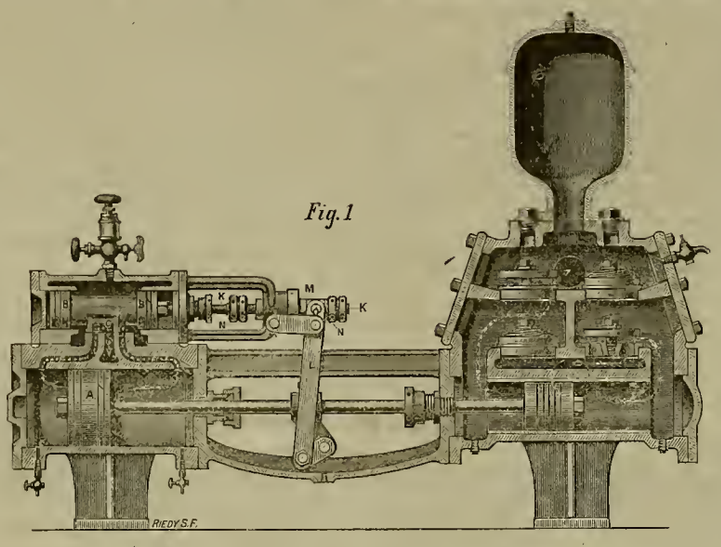
The Dow Steam Pump.

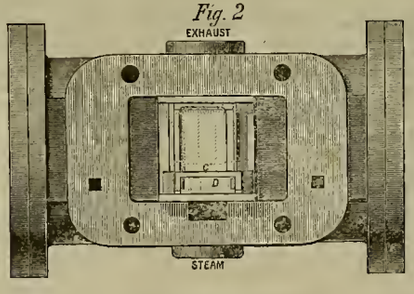
The pumps made at the Dow Steam Pump Works in this city have been adopted by some of the largest engineering firms and modern enterprises on the Pacific Coast, and are built with many modifications to meet special requirements. The improved valve motion, taken together with the simple construction of flat steam slide valves, ingeniously arranged to effect a proper distribution of steam to handle the pumps, under all conditions of speed and pressure, entitles it to its reputation as a most positive motion independent steam pump that can be maintained to its work by single adjustments within the means and knowledge of the engineer in charge. There are no small obscure ports or passages in the steam chest to puzzle the engineers when they become deranged.

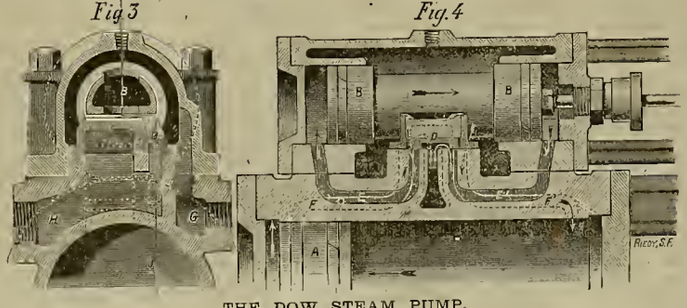
Sectional views herewith, will serve to illustrate the elements employed to perform the distribution of steam in operating the pump, whereby the main steam piston, with its rod directly connected to the pump piston, is caused to reciprocate within its cylinder and have no point in the stroke where it cannot start when steam is turned on, and be able to run at the lowest possible speed without centering, *i. e.*, with the main valve in such a position that the main piston cannot reverse. Also gradually starting and stopping the piston close to the ends of the cylinder, with safety at high speed, so that the pump cannot do itself injury; and to allow the water valves to seat quietly before the return stroke commences.

By reference to longitudinal section Fig 1, it will be seen that a plain slide valve C is used to actuate the main steam piston A, through the ports F and F', as indicated by the arrows. This valve is moved in connection with auxiliary piston B, a recess being provided in the latter for that purpose. Reference now being made to plan of valve seat, Fig. 2, the main valve C is shown together with a small flat slide, or auxiliary piston driving valve D. The requirements and action of this auxiliary valve, will now be described and reference made to center cross section Fig. 3, which shows auxiliary piston B, main valve C, auxlliary valve D, steam inlet G and exhaust passage H; Fig. 4 being a longitudinal section showing auxiliary valve D and ports E and E', through I, J, Fig. 3.

With the steam piston A, moving in the direction of the arrows, motion being imparted to the valve stem K, by means of the vibrating arm L, and sleeve M, acting against adjustment nuts N, on valve stem K, as shown. The valve driving piston B, being fixed to valve stem K, will move the auxiliary slide valve D, over the ports E and E', at the same time with but a little in advance of the main valve C; both valves being carried in a recess of the auxiliary piston B, and a slight longitudinal play or lost motion allowed the main valve C, to enable it to follow slightly behind the auxiliary valve D, relatively causing the latter to lead the main valve C, and just before the steam ports F and F' are closed, controlling the admission of steam to, and exhaust from, the main cylinder; steam will be admitted to the chamber of auxiliary piston B, through port E, and exhaust from the other end through port E, acting upon the piston B, to continue the movement to reverse the valves thus far produced by the positive mechanical connection to the main piston A, governing its movements in the cylinder. It will be observed that the main steam piston A, main steam valve C, also auxiliary piston B, and valve D, are moved with a positive mechanical connection in such a manner that the main steam and exhaust ports are closed with each movement of the piston; and that to work this piston close to the ends *positive* in its action. As the main valve C is moved by a mechanical connection from the main piston entirely, in closing its ports, much steam is saved from uselessly rushing into the cylinder on completing each stroke, thereby reducing the terminal pressure and quality of steam used for every movement of the piston.







THE DOW STEAM PUMP.

of the cylinder, is but a matter of the adjustment of the nuts N. The piston is thus slowed down gradually upon completing its stroke particularly in running fast (when most required) allowing the water valves to seat quietly, preventing concussion or jar, common in other steam pumps. It cannot strike the cylinder head in running fast, as the main valve C will be reversed in time to prevent it.

The employment of auxiliary piston B, its valve D, and operated in connection with main valve C, as described, allows the pump to work at any speed, however fast or slow, without a dead point in the stroke, being thereby perfectly

It will be seen from the above that the main steam valve is moved mechanically by the engine, and with the same certainty as the slide valve of an ordinary crank engine operated by an eccentric. It does not, however, as in the latter case, depend upon the power stored up in a fly-wheel to carry the main valve past the center of its travel; as the steam pressure acting on the auxiliary piston, through the medium of the small auxiliary valve, which is moved in connection with the main valve, and in such a manner as to complete the movement of the latter, commenced by means of its connection with the main piston.

Safety Lamps in Mines.

The use of the various kinds safety lamps in coal mines is now so universal that we often wonder why it is accidents occur as frequently as they do from fire damp. One thing is true, that the regulations are usually strict enough; but possibly the men are not always as fully informed concerning the use of the lamps as they ought to be. In addition to the regulations, the miner should be informed of the special recommendations with respect to the use of his lamp. He should be especially advised to handle the lamp carefully; not to expose it to too strong currents of air; and not to produce in the air, by shaking his clothes or otherwise, violent motions capable of agitating the flame of the lamp. He should also be recommended not to expose his lamp to be broken or injured, and to hang it up in the working place in such a manner that it be not likely to fall, and so as not to be in danger of being struck by a pick. Those men who are provided with a Mueseler lamp should be informed that it is easily extinguished when inclined; and that it goes out in an atmosphere containing fire-damp in explosive quantity. Those who, under exceptional circumstances, are entrusted with a Davy lamp, or one of similar character, should be informed of the special danger which it presents when filled with flame, or when the gauze becomes red hot. It should be pointed out to them, that in such a case, they should not blow on to the flame, but that they should, on the contrary, protect it carefully from all air current, agitate it as little as possible, and cover it as well as they can with their clothes or hat; and immediately, but without precipitation, abandon the dangerous place where they may happen to be. In fine, they should be shown the characteristics by means of which the lamp, of whatever type it may be, is capable of indicating the presence of gas, and be recommended to complete their information on this point, as well as on all others, in the mine itself, through either their comrades or the foreman.

The men provided with a safety lamp ought to examine it frequently, so as to ascertain the state it is in, and appreciate the conditions of the atmosphere wherever they may happen to be; in a working place the man acting as a chief is specially charged with this examination. He ought to be especially recommended, when he sees that the flame of his lamp becomes elongated more than usual, to proceed to an attentive search for fire-damp by bringing his lamp into all parts of the working place. If this gas be not merely limited to a few points, and present in unimportant volume, but if it be tolerably general in the working place, he must clear it of the men and give notice at once to the foreman.

The head of water in six-mile canyon is unusually light for this season of the year. The various quartz mills are compelled to run at only about half their capacity. The stamps are kept pounding away through the day, and are hung up at night, when the pans are stirred up for the purpose of amalgamating the pulp crushed through the day, as the water power is now insufficient to run both stamps and pans.

News from Wood River is to the effect that the deputy sheriffs are to be withdrawn from protecting mines—Broadford being quiet and the mines having a complement of men.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Fresno County Mines.

[Written for the PRESS by F. W. S.]

The mineral resources of Fresno is a matter of no small importance. Situated in the eastern and northeastern end of the county is a number of districts that so far as developed have proven to be rich in both quality and quantity of their ores. The three principal districts are the Potter Ridge, Quartz Mountain and Fine Gold. They adjoin each other in the order mentioned; the first mentioned being the farthest north. The ores are free milling quartz, and run from $10 to $80 per ton. The cost of extracting and milling is said to be from $6 to $25 per ton. Lack of water for milling purposes is the greatest drawback to these districts. A twenty-five mile ditch with a carrying capacity of 4,000 miners' inches, is being constructed by the Quartz Mountain Mining Company. This ditch, it is thought, will be complete by July next. In addition to their own wants, this company will be able to supply the prospectors and mine owners of the district with a sufficient supply to develop and discover more new mines.

Potter Ridge District.

This is Fresno's most promising mineral district. It is some 60 miles northeast of the city of Fresno. The mineral belt runs north and south, and is on an average some four miles wide. This district claims in length some eight miles. A number of stamps, a Red Stone and a Huntington mill have been put up in the district, and are all reported as being steadily at work. The character of the ores and the necessity of extensive works for the profitable treatment of low grade ores make this district one that can only be successfully opened by capital. True fissures are said to exist in both this and the Fine Gold district. Two months hence development will be increased and the output is expected to be sufficient to boom the mines of the county.

Quartz Mountain District.

Miners interested in this district, claim everything in the shape of mineral bearing ores; not only this but "oodles" of it. In the way of veins the district boasts of all kinds, from a gash vein to one the width of the district. The Quartz Mountain mine is said to have derived its name from the fact of its being on a whole mountain of quartz. The company have put up a 60-stamp mill and will, it is said, erect another one of the same number of stamps as soon as their big water ditch is finished. On their main vein they have run an incline to the depth of 240 feet, at which point a 50-foot drift on each side of the incline shows a 9-foot vein of ore that pays over $15 per ton. This company have some 600 acres of patented ground and will undoubtedly reap an abundant harvest when their extensive works are working on full time.

Fine Gold District.

But little development has as yet been made in this district. The mineral belt is about four miles wide by eight miles long. The characteristics of the ores are the same as the Potter and Quartz Mountain, only that in richness the quartz of Fine Gold is much the best. There are a number of stamp mills in the district; also a Huntington mill. A sale was recently made to San Francisco capitalists of a mine in this district for something like $25,000.

The miner is now a resident of Fresno City. Preparations are being made to push the work of development on the mines of this district during the next 60 days. From $25 to $200 per ton is claimed can be realized on the ores of Fine Gold.

Silver Mines.

The Mount Raymond mines, near the Mariposa Big Trees are claimed to be developing wonderful results. The formations are limestone and porphyry. The ores are galena. A test shipment recently made to the Selby Works, at San Francisco, is said to have returned $50 per ton in silver and 55 per cent in lead. These mines will be closely looked after during the spring. Many locations have been made, and the woods will probably be full of prospectors as soon as the season opens.

Iron Workers' Wages.

EDITORS PRESS:—We have seen a clipping from the San Francisco *Chronicle*, under date Feb. 20th, and must say that the statement made by Mr. Richard Savage, of the Empire Works, surprises us. We have a fair knowledge, we think, of the wages paid to mechanics in all lines of business in the manufacture of iron on the Pacific Coast, and we know that the present rate of wages paid in San Francisco is no higher than the rate of wages paid to mechanics in this city by *our firm*. We pay the highest rate of wages of any institution we know of in the East engaged in our line of business. We employ the very best line of workmen, and it is small business, we think, for Mr. Savage, of the Empire Works, or any one else, to try and make a reduction in the wages of their workmen *by claiming* that it is a necessity, owing to the fact that *we* are paying 25 to 40 per cent less in our shops to our men, than Mr. Savage and others in the same line of business are paying in San Francisco.

We dispute the truth of this statement. Of course, if the Pacific Coast manufacturers find it necessary to make a reduction it is their business, but we think they should make the reduction without reflection upon manufacturers elsewhere, especially when they make statements that are sototally in the wrong as the statement made by Richard Savage, of the Empire Works.

We ask that you will give space in your next issue to this letter, as we feel that we are justified in denying the statement made by Mr. Savage, as published in the San Francisco *Chronicle*, about the 20th ult.

Yours truly,
FRASER & CHALMERS,
Chicago, Feb 29th.

California's Exhibits at the World's Fair

The California section in the government and States' building at New Orleans occupies 14,450 square feet, the second largest space of any State or Territory—Texas having 18,145 square feet, and Kentucky, the third largest, having 13,100. This space is chronicled on Chief of Installation Mullen's books as taken by C. B. Turrill for the Southern Pacific Railroad Company of California. Mr. Turrill's company has not only made almost the entire display which is to be seen in the name of California, but has permitted its agent to act as Commissioner since the opening day.

The following summary of California exhibits is made by a correspondent of the *Bulletin*:

1. The section of the Calaveras big tree and bark, which is a great attraction—probably the greatest in the building.

2. The very handsome exhibit of blankets from the Golden Gate Woolen Mills, which is also particularly attractive.

3. The honey exhibit of J. E. Pleasants, of Los Angeles county; the finest display of the kind ever seen in any land.

4. A fine display of canned and evaporated fruits, seeds, grains and grasses, cocoons, vegetables, raisins, cheese and wines from Sonoma county.

5. A table containing mammoth squashes, beets, pumpkins and sweet potatoes from Santa Clara and Los Angeles counties.

6. Stand of shelves with fruits, berries and grapes in solution from Sonoma county.

7. Three two-wheeled vehicles from California manufacturers.

8. Stand of shelves of jars of wheat and other grains from Yuba, Colusa and Sutter counties.

9. Stand of shelves containing jars of one hundred kinds of almonds from Solano county; also raisins from Brigg's Bros., same county, and a fine display of grains in glass, and raisins and prunes from Vacaville, and fruits in solution.

10. A magnificent pyramid of pampas plumes from Santa Barbara county.

11. Stand containing wines, fruits, dried and in solution, grains, cocoons, almonds, walnuts and filberts from Nevada county.

12. Evaporated fruits, Irish potatoes, fruits in solution, grain in jar and on stalk, and slate from Napa county.

13. Stands of shelves of Napa county port, Reisling and Zinfandel wines; also honey, potatoes, fruits in solution, and grain on stalk from Napa county.

14. Stand of shelves with Angelica, sherry, white and claret wines from Napa county.

15. Cube representing the actual amount of solid silver taken out of California mines ($26,000,000.)

16. Cube representing output of gold in California since the discovery ($1,078,685,167). Eight large cases of California mineral specimens.

17. Case of woods from various parts of the State.

18. An invention of hydraulic mining, displayed by Hoskin & Co.

19. Two tremendous planks from the California Redwood Company of San Francisco.

20. A lot of redwood posts and ties, some of which have been in use in the ground for twenty years.

21. A monster redwood plank from W. H. Perry, of Los Angeles.

22. Large number of specimens of redwood, laurel, willow, manzanita, in sections and in timbers and lumber, finished, polished and otherwise, some of which are sent from Pope & Talbot.

23. Saw and stand from N. W. Spaulding & Co.

24. Another lot of California woods.

25. F. A. Huntington's centrifugal roller quartz mill.

26. Sanborn's new chain pulley.

27. A magnificent exhibit of redwoods from the Loma Prieta Co., including many curly and bird's-eye varieties in a high state of polish.

28. Another exhibit of California woods, including pine of many kinds, redwood, sycamore, maple, mahogany, mulberry, myrtle, laurel, live-oak and other oaks, lemon verbena, manzanita and other woods.

29. A great display of all kinds of nuts, raisins, vegetables, grain in jars and on stalk, and fruits dried and in solution, from the rancho Chico.

30. Stand of corn from Butte county.

31. Table containing corn, canned fruits, cocoons, fruits in solution and a monster squash from Butte county.

32. Fine display of fresh fruits and fruits in solution, seeds, soil and wood pulp in various stages, from Placer county.

33. Fruits in solution, grain in glass and on stalks, beet sugar, walnuts and evaporated fruits from Alameda county.

34. Table of apples which were picked in September last and which show no signs of decay.

35. Bale of alfalfa, flour, peanuts, soil, mineral waters, grain in jars and on stalk, fire-brick and sewer-pipe, horse shoes, beans, potatoes, cocoons, squashes, and hops from Sacramento county.

36. Wheat, corn, maize, dried fruits in solution, raisins, sweet potatoes and grapes from Yolo county.

37. Squashes, almonds, beets, potatoes and dried fruits from Sacramento county. Grains in jars and on stalk, dried fruits, harvester model, horse medicine, insect powder and wheat and flour in bags from San Joaquin county.

38. Table of macaroni and vermicelli in boxes with glass covers from San Francisco.

39. Five bales of cotton and samples of soil from Kern county.

40. Stand of shelves containing corn, wheat, cotton and fruits in solution from Tulare, Merced and Stanislaus counties.

41. A splendid exhibit of assorted wines from Sonoma county.

42. Stand containing buck kids for gloves from Napa county and Mrs. Hill's insect powder from Calaveras county.

43. A stack of flour from Horace Davis & Co., San Francisco, and from Sperry & Co., Stockton.

44. A fine stand of California brandy from Jarvis & Co., San Jose.

45. The Pacific Incubator, from Oakland.

46. A stand of wheat and flour in bags from Santa Clara county.

47. The squash weighing 222 pounds and some monster sweet and Irish potatoes.

48. A handsome model of the "Cyclone" windmill from San Jose.

49. A stand of the celebrated Naglee brandy, built in pyramidical shape.

50. A pyramid of Cartalian water.

51. Stand of shelves containing fruits, dried and in solution, figs, raisins, wheat in jars and on stalk, nuts, and a line of wines from Fresno county.

52. Stand containing fruits in solution, dried and evaporated, burr clover, wheat in jars and on stalk, beans, nuts, barley, peas, grapes, jellies and monster beets from Santa Cruz county.

53. Five bales of hops from Sacramento county.

54. Stand of shelves containing a full line of seeds from W. R. Strong & Co., Sacramento.

55. Leather in rolls from the California Leather Co., of San Francisco.

56. A case containing 58 varieties of beans from Santa Barbara county.

57. A matchless exhibit of oranges, lemons, limes, walnuts, almonds, dried, preserved and evaporated fruits, olives, olive oil, raisins, figs, seeds, fruits in solution, tobacco, cocoons and red and white wines from Santa Barbara county.

58. A splendid exhibit of raisins and semi-tropical fruits from Riverside, San Bernardino county.

59. Stand containing 100 varieties of preserved fruits, berries and grapes from Mrs. George A. Cook, Lugonia, San Bernardino county.

60. A marvelously fine display of oranges, lemons, limes, almonds, walnuts, peanuts, chestnuts, olives, olive oil, wheat, flour, barley, rye, canary seed, corn, oats, grains, pampas plumes, dried, preserved and evaporated fruits, fruits in solution, salt, tobacco, cotton, raisins, figs, ostrich eggs, cocoons, etc., from Los Angeles county.

61. Hemp, grain, canary seed and fruits in solution from San Mateo county.

62. Grand exhibit by National ranch of San Diego county of grains and corn in jar and on stalk, olives and olive oil, jellies, fruits in solution, dried and preserved, grains, hemp, grapes, figs, raisins, etc.

63. Cases of cocoons, skeins, cloth and threads of silk from San Jose, but sent by Keane Bros., of San Francisco.

64. Table of ale and porter from the Stock Brewery of San Francisco.

65. Table of assorted wines from J. Gundlach & Co., San Francisco.

66. A stack of Wellington's egg-food.

67. C. Richard Knapp's vacuum-press percolator.

68. Table of shelves containing Paul Rieger's extracts and ginger, desiccated cocoanut from the Pacific Cocoanut Company of San Francisco, Siam rice from the India Rice Company of San Francisco, macaroni and vermicelli from the Italian Paste Company, seeds from R. J. Trumbull & Co., and canned salmon from King, Morse & Co., oriental powder, Hanly's catsup, etc.

69. Case of gloves and case of elastic trusses and German granulated soap from San Francisco.

70. Table containing California literature, including 70 kinds of books and pamphlets and many papers.

71. Pyramid of canned goods from Cutting & Co. of San Francisco.

72. Whole line of goods of Guittard & Co. of San Francisco, embracing chocolates, cocoa, spices, teas, etc.

73. Model of street-car with safety guard, faucets, asbestos, demijohn boxes, fruit steamer, boiler cleaning compound, etc.

74. Handsome exhibit by San Francisco Varnish Works.

75. Case of giant powder (or what is supposed to be giant powder), and fuses.

76. Exhibit of borax by William T. Coleman & Co. of San Francisco.

77. Case containing the shovel which cast up the first earth in the construction of the Central Pacific Railroad.

78. Twenty cases of California grains and flowers, each containing 50 plates, arranged by Prof. Lemmon and wife—a very fine exhibit.

79. Tibbal's patent sanitary sewer trap and tide gate.

80. Two Antisell pianos.

81. Four cases of Bancroft's books.

82. Archer's mammoth bee-hives, from which 770 pounds of extracted and 60 pounds of comb honey may be taken from a single hive in a single season.

83. Stand of corn-broom, corn and mammoth vegetables from Los Angeles county.

84. A very attractive pyramid of crystallized fruits in a high glass case from Barnard & Benedict, Los Angeles. This is a very handsome exhibit and attracts great attention.

85. Bale of alfalfa, stand of wild oats and jucca dragonis from Los Angeles county.

86. Fine display of wines and brandies from E. J. Baldwin, Los Angeles county.

87. Stand of shelves of Fredericksburg beer in pints and quarts.

88. Stand of fruits in solution, jellies and preserves from Santa Clara county.

89. The same, mostly from San Jose.

90. Display of honey from Williams Bros., Los Angeles county.

91. Orange and lemon trees in fruit from Los Angeles county.

92. Sugar-cane, tobacco and cotton plant, and a large variety of grains from the National ranch, San Diego.

93. Table of oranges, limes and lemons, just received from Wolfskill, Pasadena and Santa Ana ranch, Los Angeles county.

94. A beautiful exhibit of pampas plumes by Mr. Stewart, of Los Angeles.

95. Last, but not least, two handsome displays of soap by the Standard Soap Company of Berkeley.

Besides all these, Jarvis & Co., of San Jose, E. J. Baldwin, of Los Angeles county, and Jackson, of San Francisco, make exhibits in the main building—the former of brandy, the second of wines and brandy, and the last-named of abalone jewelry and other work.

Ruby Hill Tunnel.

A reporter of the *Sentinel* visited on Sunday last the Ruby Hill Tunnel, an enterprise owned and managed by miners and residents of Eureka. The tunnel or adit is meant to prospect at depth the properties of the Ruby Hill Tunnel and Mining Company, comprising the Wolverine, Jones and Kyle, Nondescript, Tip Top, Ma Ma, Mary Ann, Bottom Claim, Little Mack, Silver Brick, New Claim, Try Square, Cosmos, Compromise, North Tyndal, Tyndal, Plumed Knight, Van Buren, Perry and Jeff claims. The company has also secured a title to an eligible millsight at the mouth of the tunnel. The titles to all the above properties have been secured from their original owners, they taking stock in the present corporation in payment for the same. The tunnel was commenced some two years ago, during which time the header, 5x6 feet, has been advanced a distance of 860 feet. The entire work has been done by contract, and the cost of the same has been raised from time to time by one cent assessments. It is about the most economically managed piece of mining in Eureka district. The stock is all closely held, and it is believed that when the tunnel header is advanced another hundred feet a rich mineral section will be tapped. Thus far a great many good-sized pockets of iron have been encountered and passed through, also crevices, into which stones can be thrown and heard to rattle down a distance of 100 feet. The character of the face of the tunnel is lime stained with iron and containing pockets of iron. Many who have a practical knowledge and understanding of the formation of that section of mineral country, wherever prospecting has been done, have wondered why the company has not prospected on indications passed through, so promising are they, but it is the company's desire and intention to reach a given point with the tunnel header before any prospecting is done. The surface indications of the numerous properties are most encouraging. Should the owners of the enterprise realize one-third what they have reasonally a right to expect as the result of their present work, it alone will perpetuate this town for many years to come.—*Eureka Sentinel.*

THE EUREKA FOUNDRY.—The Eureka foundry has again commenced operations, and a number of men there are busily employed in making castings for the New Eureka Con. furnaces, some of which castings will weigh upwards of 3,000 pounds each. Aside from the side issues in connection with a few large reduction works, this is said to be the only foundry now operating in Eastern Nevada.

MECHANICAL PROGRESS.

Cast Iron Malleable.

After all that has been written to define the difference between malleable iron and cast iron made malleable, there is a lack of information that requires further statements of facts. In the parlance of our English cousins, malleable iron is our "wrought iron." All wrought iron is considered malleable—capable of being spread under the hammer—but our malleable iron is brittle cast iron made capable of being bent cold, of being changed as to form by pressure or by percussion, and sometimes of being forged like real malleable, or "wrought" iron.

But cast iron can be softened without being made malleable; it is simply a process of annealing. Small articles of cast iron frequently become so chilled in the sand of the mould as to be impervious to the coaxing of the file or the persistence of the drill. In some establishments where minute iron castings are made, it is necessary to anneal them, even if they are not to be subjected to any tool processes; the attrition of the tumbling barrel would test their tenacity. As they come from the foundry, they are as brittle as nnannealed glass. To anneal these brittle products, they are packed in cast iron boxes with sand—ordinary quartz sand—subjected to a red heat for about forty-eight hours, and allowed to cool gradually. There is no chemical virtue in the sand—it is merely a conservator of the heat, and the degree of heat is not sufficient to fuse the sand or to even round the corners of the sprews of the castings.

But to make cast iron malleable—to change its quality from the brittle, almost vitreous, condition of the casting to that of the almost plastic or malleable quality—requires a different treatment. The art is not modern, for as long ago as 1826 the Franklin Institute awarded a premium to Seth Boyden, of Newark, N. J., "for an assortment of huckles, hits, and other castings of annealed cast iron remarkable for smoothness and malleability." The uses of the process have been greatly extended since 1828, and its possibilities are better understood now than then. Kitchen spoons which are to be tinned are not made of wrought iron, but they are cast and made malleable. The blanks for the spoons are cast of iron, perfectly flat, giving only the outline of a spoon. These blanks are so brittle that they have to be handled like eggs in packing them for the softening process. When made malleable and cooled, they are "struck up"—formed—in dies, and thinned or nickeled. Skate irons are produced in the same way. The irons are cast iron; then subjected to the malleable process, dressed and finished, and case-hardened. It is claimed by some skaters that these skate irons are superior to those made of steel.—*Scientific American.*

The Turning Lathe.

But few people realize the extent to which turned work is used in cabinet work, and a still less number know of the perfection reached by the turning lathe.

Less than a hundred years ago, pole lathes were in operation. They consisted of two centers, the work hung between them, the ordinary rest, a spring pole overhead with rope attached. The rope was passed twice around the wood to be turned, and the foot placed in a noose near the ground. When the weight of the body was thrown upon the rope the wood revolved between the centers. When the pressure was removed, the spring pole, from which this machine took its name, caused the noose to ascend ready for another tread. The turner applied his gouge at the same time he did his foot, and thus worried off some of the wood. To trace step by step the improvements in this machine would require a volume.

The application of continuous rotary motion by the pulley, belt and fly-wheel was a big step. Then the lathe was capable of its best work. All later improvements have only tended to increase the quantity instead of the quality of its production. Mr. Weymouth, of Fitchburg, Mass., by his lathe, increased a thousand-fold the production of this tool. His lathes are known the world over.

For large work the spiral back knife does the business slick and clean. The knife is first forged to fit a cylinder in such a manner that it extends one-third the way, or less, around it. It is now put in an engine lathe, still upon the cylinder, and turned.

This makes a plain spiral knife. It would trim a straight object. Now, the design is cut upon the face of the knife. If a table-leg is to be made, the knife is turned down until that leg will just fit into it. The shape of the knife will be just opposite that of the pattern. When finished and tempered, the knife is hung back of the lathe. A tool upon the sliding carriage takes off the corners and then our back knife comes slowly up to its work; being spiral, but little cutting surface is at work at one time, and it cuts easily, cleanly and quickly. No matter which way the grain runs, this knife cuts it off and the work is soon done. Spiral cutting knives are the thing to have. They will do lots of good work.

METAL CUTTING MACHINERY BY A LADY INVENTOR.—Madame De Long, it is announced, is about to introduce into England, metal-cutting machinery of her invention, which has for some time been in use in France. She first conceived the idea of her wonderful apparatus nearly twenty years ago, when paralysis of the right arm forced her to abandon the trade of jeweler-worker. She has now perfected machinery, worked by steam power, which cuts with the utmost precision the hardest and softest metals, in any design. By it she can cut a gold lace pin or a steel castle portcullis from the solid metal, without any molding or filing. And all her apparatus and operations are of the simplest description. She divides her industry into four general branches. The first is the production of gates, doors, balcony-fronts and other architectural metal-work, without casting. She has cut plates of brass a foot thick into lattice-work at a single operation. The second branch is the making of lattice metal-work filled in with glass, to supersede the ordinary leaden frame-work for church and other ornamental windows. The third branch comprises the inlaying of plush and ebony jewel-cases, cabinets, etc., with red and yellow copper, steel and other metals. The fourth department comprises the working of picture frames, baskets, crests, monograms, etc., turning them out of the solid metal fully finished without a single operation being performed by other means than the self-driven machinery.

Unequal Shrinkage in Castings.

The internal strains and forces that exert themselves within the material of a casting is enormous when the different portions are allowed to have their own time to cool, but can be partially removed by a gradual change in the temperature. The circular saw will neither buckle or run dishing while every part is heated alike, but is badly thrown out of order when heated in the center from an overheated bearing, or rim bound in the saw skerf. In the casting of a pulley, if the rim cools and sets first, the arms and hub must continue to contract and exert a strain on every part of the pulley. In the broken wheels that are sent to the repair shops, the arms are separated quite a distance from the rims when they have become injured, and the broken rim of a wheel shuts by so far that it is impossible to bring the rim in place without heating the arms and the hub in the center. Whatever part of the casting first sets, in cooling, must receive the force of contraction of the remaining parts, and the material in the center of a casting shrinking away from the outer surface must leave the casting porous and spongy. The exposed surface, in cooling, contracts and forces the material in the center to either escape or to occupy a smaller space, when in turn it last becomes cool and tends to draw the outer portions of the material after it toward the center. Advantage is taken of this principle to diminish the diameter of the bore of a piece of work by heating it to redness and cooling the outer surface, which forces the material around the bore to occupy a smaller diameter before the particles set in cooling. A tube thrust endwise into cold water, slowly becomes cooled to the water's edge and crowds in the heated material just above the water mark toward the central line of the tube, which in turn applies the force of contraction to those above them as the tube is slowly lowered into the liquid. Several applications are sufficient to refit a piece of work that has become quite loose. To avoid these internal strains, the arms of wheels are left curved, or if straight are inclined with the radius of the wheel, that the force of contraction may draw them into line with the face, or if curved, to pull the hub around till the strains are equalized. The pattern makers should know how the castings are handled in the foundry if they are not to be weakened by the contracting strains that exist within them.—*Boston Journal of Commerce.*

STEEL VS. PUDDLE IRON.—Notwithstanding the inroads which steel is making on the iron trade, it is apparent that the newcomer still has a very serious task ahead of it to supplant its ancient relative. This is very forcibly shown by a recent article in the Pittsburgh *Dispatch* descriptive of the condition of the puddling departments of the Pittsburgh iron works. Discarding the details given, we observe that the present total daily product of puddled iron in that city and its immediate vicinity is about 1,150 tons, which is 200 tons more than was turned out two months ago. A year and a half ago, says the *Dispatch*, the daily product of puddled iron reached between 1,600 and 1,800 tons. As a great part of the diminished output of puddled iron is the result of the depression in trade, and the daily product is still very considerable, it will be seen that the converter and the open hearth have much to do before they supersede the puddling furnace completely.

IMPROVED PRINTER'S CHASE.—A printer's chase has been invented in Milwaukee, and patented, which is adjustable in both directions. By a system of slides in the bars, fixed by set screws, the chase may be extended or contracted upward of one-half its superfices. In fact, it may be used as a self-locking chase—dispensing with furniture.

THE UNITED STATES makes one-fifth of the iron and one-fourth of the steel in the world. Of the gold supply this country furnishes one-half, and of the silver, one-third. The United States represents 36, Great Britain 33, and all other nations, 31 per cent of the mineral industries of the world.

SCIENTIFIC PROGRESS.

The Study of Thunder-Storms.

"The knowledge of thunder-storms," says *Science*, "is advancing at a good pace. France has made special study of them for a number of years. Bavaria and Belgium have more recently taken them up, and last summer they were made the subject of special investigation by our signal service, with the aid of a large corps of voluntary observers, that is to be continued during the coming season. A recent report by Lancaster, on the storms of 1879 in Belgium, confirms the conclusions previously announced there, and discovered to obtain so clearly in this country, that thunder-storms occur only in the southeast quadrant of the barometric depressions, or great cyclonic storms that frequently sweep across temperate latitudes. But there still remains to be found the actual mechanism of thunder-storms, concerning which various more or less theoretical opinions have been published. The matter will probably remain in doubt until settled by the same kind of investigation that demonstrated the inward spiral path of cyclonic winds. Synoptic charts for a stormy afternoon, with hourly or even half-hourly intervals, and stations only a mile or two apart, would probably settle the question beyond dispute, and the first local weather service that succeeds in preparing a set of such charts will gain a prize worth working for."

Their Origin.

At the recent congress of German medical men and physicists, Dr. S. Hoppe, of Hamburg, read a paper in which he sought to show that the electricity of thunder-storms is generated by the friction of vapor particles generated by the evaporation of water. This opinion was strengthened by several experiments in which compressed cold air was allowed to rush into a copper vessel containing warm, moist air, thus generating a large amount of electricity. He concludes that the rise of a column of warm, moist air into the colder atmosphere above will be followed by a thunder-storm if it acquires sufficient velocity to prevent neutralization of the electricity generated by the friction of the air. Hence, in his opinion, open districts denuded of forests are more liable to thunder storms than wooded regions, where the trees forbid the rise of humid air currents. We may cite in evidence of this, the fact that there is no part of this continent where severe and violent thunder-storms are so frequent as upon the treeless plains between the Mississippi river and the Rocky mountains.

Photographing Thunder-Storms.

A new and interesting feature in connection with this study is the fact that the camera has lately, in several instances, been brought to bear upon different instances when these meteorological phenomena have assumed extremely violent proportions and developed what are commonly termed "water spouts." A Kansas tornado which occurred in April last has thus been shown, engravings from which have appeared in several scientific publications. An unusually violent tornado which occurred in Dakota in August last was also photographed and transferred to wood by engraving. Although the destructive effects of tornadoes have often been photographed, we believe those referred to were the first views ever taken of a tornado itself. They were taken at a distance of several miles from their actual track. It is to be hoped that opportunities will be presented for additional work in this direction during the coming season.

An Awful Night at Sea.

In this connection we would give the following account of a most remarkable meteorological disturbance which was telegraphed to the *Morning Call*, of this city, from Victoria, B. C., on the 2d instant: "The bark *Innerwick*, Captain Waters, thirty-one days from Yokohama, has just arrived and the master reports a very stormy passage. At midnight on February 24th, in latitude 37 north, longitude 170 degrees 15 minutes east, the wind was blowing heavy from the south southeast, with the ship running before it under short sail. At 1 in the morning it increased to a living gale with the sky of a pitchy blackness. At 5 o'clock the captain, who was aroused by the mate, went on deck and found the sky changing to a fiery red as if the entire heavens were in conflagration. All at once a large mass of fire appeared over the vessel, completely blinding the spectators, at the time, and as it fell into the sea some fifty yards to the leeward it caused a hissing sound, heard even above the blast, causing the vessel to quiver from stem to stern. Hardly had this disappeared when the mate, clutching the captain's arm, cried: "My God! what's that?" pointing to a towering mass of foam rapidly approaching the apparently doomed vessel. The noise from the advance of the volume of water is described as deafening. As the bark was struck flat aback, and before there was time to touch a brace, the sails filled again, and the roaring white sea could be seen passing away ahead. To increase the horror of the situation another vast sheet of flame ran down the mizzen mast, from whose rigging poured myriads of sparks, and for twenty minutes the strange red of the sky remained. The master, who is an old and experienced mariner, declares that the awfulness of the sight was beyond description. He considers that the ship had a narrow escape from destruction.

Science as an Aid to Surgery.

There is no instance on record of perversity more unreasoning and unreasonable than that which appears to animate those who oppose experiments upon living animals with the view of solving physiological problems, which, without the method of direct operations upon living animals, must remain unknown. The beneficent results that have been obtained by this method of research are so evident to all who will examine the subject, that the attitude assumed by the anti-vivisection extremists is most illogical.

Without repeating what we have said in previous articles on this subject, we desire to place on record another striking example of the practical benefit to humanity that has resulted from experimental researches conducted upon living animals with the view of increasing our knowledge of the functions of different portions of the brain. These results could have been obtained in no other way than by direct operations on the brain substance of animals. The experiments in question demonstrated what had never before been thought possible—that the brain may be handled, irritated, and, in fact, partially destroyed, without necessarily endangering life. More than this, they have demonstrated the important fact that there are in the brain certain "centers" which preside over voluntary motion, which centers it has been possible to localize with great precision, and, as one of our contemporaries forcibly puts it, "a topography of the cerebrum has been constructed, in which the various faculties have been mapped out."

The experience of physicians has enabled them heretofore to determine, from certain symptoms, the existence of disease of the brain, but they have been quite in the dark in the matter of locating it, and the unfortunates so afflicted were beyond reach of human aid.

The knowledge gained by experiments upon animals in the laboratory of the physiologist, however, has given the surgeon such precise and valuable knowledge of the local functions of the brain, that in many cases he is enabled now, from a careful study of symptoms, to locate a tumor at a certain definite spot within the brain, and by surgical operation to remove it, a feat which has been successfully accomplished.

PERMANENCE OF THE OCEAN BEDS.—Although geologists are accustomed to deal with considerable alterations of level as one of the causes operating to bring about profound changes in the topography of many regions, it has always seemed difficult to conceive that the vast depressions in the face of the earth now occupied by the oceans, could ever have been subject to such tremendous changes as would be necessary to convert them into land. Many geologists appreciating this difficulty, are inclined to believe in the general permanence during all time of the great oceanic beds, and of the continental areas.

To account for the origin of the oceanic basins, Mr. Fisher, in the Geological Magazine, proceeding from the theory of Prof. Darwin, that the moon broke away from the earth more than fifty million years ago, he thinks the ocean basins may be the scar left by the breaking off of the moon's mass, and that the basement rocks of the continents are fragments of the crust which had already solidified, and which were left behind.

THE ANCIENT CHINESE WERE MOUND BUILDERS.—Searching the history of China for evidence of a stone age, Joseph Edkins finds that as far back as B. C. 2,205, in the time of Yu, all the common metals are mentioned in a list of tribute offered the emperor. Fifty years before the Emperor Shun had buried gold to make the people less covetous. A stone hatchet has lately been found near Kalgan in a mound 40 feet high. The mound and others in its neighborhood are said to resemble those of Ohio, and the hatchet is not to be distinguished from those of the "mound builders" in Ohio museums.

OLIVE OIL.—If fatty oils are cooled down to —20°, and kept at this temperature for three hours, they assume very different degrees of hardness, olive oil being the hardest. To determine this point the author uses a cylindrical iron rod, one centimeter in length, and ending below in a cone. Upon it is exerted a pressure measured in grams until it penetrates into the oil with its entire length. The best olive oil required a pressure of 1,700 grms., while the cotton oil required only 25 grms.

RAILROAD TIME TABLES.—All the railroad time-tables are planned, and all changes made upon them, by the use of spools, pins and colored thread, instead of pen and ink. Paper is marked off by horizontal and perpendicular lines into five, ten, or even two-minute time, and threads are stretched across the paper to indicate the trains and fastened with pins.

THERE are supposed to be about 1,000,000 species in the animal kingdom, and the whole number of insects is set at 500,000. Of beetles alone, over 100,000 species are known; of the higher animals there are 1,200 mammals, 7,500 birds, 2,000 reptiles and 10,000 fishes.

THE first copper mine worked in the United States is said to have been in Connecticut in 1709.

MINING AND SCIENTIFIC PRESS

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Passing Events.

The Legislature has adjourned this week. The Goss hill which the miners wanted passed, as it gave the hydraulic miners a chance to work when they arranged to impound their debris, was not made a law.

The main attention of mining men is just now turned to Northern California. Both Shasta and Trinity counties will be thoroughly prospected this summer. Many men have left for the New River region and others are going by the 1st of April. There is a large section for prospectors to work over in both counties mentioned, and no doubt those who may he disappointed at New River will try other parts of that section, or come over into Shasta county.

The prices of lead and copper still remain low, and the heavy discount on silver still continues to he felt, This is bringing the gold mines to the front, and there is a demand for them among purchasers to a larger extent than has heen the case for some years. This will, without douht, redound to the benefit of California.

THE Northern Pacific is hard at work on its Cascade branch from Ainsworth to New Tacoma, a distance of 200 miles, which will he completed in a year. The war between the Northern Pacific and the Oregon Railway and Navigation Company remains unabated.

Record of California Gold Mines.

There are many gold mines in this State which are paying their owners handsomely, hut which are never heard outside the localities where they are, because they are owned hy private companies. Among these latter, one which is making a good record is the Plymouth Consolidated, owned by a compauy which was formed in June, 1883, by the consolidatiou of the Empire, the Amador, Pacific and Plymouth companies. The mines were well developed, and a considerable amount in dividends had heen paid. Prior to the consolidation, gold, to the amount of $2,500,000 had been produced. Since that time to the 1st of January of this year the mines have yielded $1,714,008.65.

During the year 1884 the company's mines produced $1,033,518, and the operating expenses were $331,163, leaving a profit of $702,354. Twelve monthly dividends of $50,000 each were paid, aggregating $600,000. The surplus over operating expenses and dividends was $102,354, which, added to the surplus of previous year, gives a total surplus of $146,914. The company has no indehtedness whatever.

A good deal of money was expended last year in permanent improvements, principally in changing the motive power from steam to water. This outlay has added largely to the value of the property, and will effect a considerable saving in operating expenses. The water power runs all the the machinery on the property, including the two mills and the hoisting works. Water is supplied from the canals of the company. Steam connections have been retained at the shafts, so in case of accident, a change could he made back to steam at an hour's notice. The water works of the company are very extensive. In addition to the several reservoirs there are canals. The main canal is 25 miles long and runs from the middle fork of the Cosumnes to Plymouth. The South Fork, or Bridgeport, is 20 miles long, and runs from the main fork of Cosumnes river nearly to Plymouth, where it joins the main canal. The Simpson canal is 22 miles, and runs from the south fork of the South Fork of the Cosumnes to the reservoir. The Douglas is 34 miles long, with lateral branches aggregating 15 miles more, and conveys water from middle fork of Cosumnes to Indian Diggings. The Tyler canal runs from the South Fork of Cosumnes to reservoir at Tyler's ranch. In addition to these there are several hranches, and also canals leading the water from Plymouth to the country below, in all about 40 miles, the whole system making a total of 160 miles of canal owned hy the company. The water used for power is brought two and a half miles from the reservoir in an 18-inch iron pipe. At ths Empire and Woolford shafts a pressure of 550 feet is ohtained, and at the Pacific shaft a pressure of 561 feet. The mining timhers are brought to the mines in the canal, saving transportation cost. The improvements have cost about $500,000, in addition to what has heen spent iu developing the mine and in operating expenses. The superintendent, E. L. Montgomery, has had charge of the property since December, 1879, while Wm. Jones, the foreman, has heen at the mines some ten years. J. J. Kerr has directed the affairs of the office at Plymouth for four years.

The property is at Plymouth, Amador county. The company owns a mile of ground on the Mother Lode. The principal mine consists of an immense showing of rihhon quartz, from 30 to 50 feet wide, and 315 to 350 feet loug. The ore mills freely and carries one to two per cent of sulphurets. Chlorination works have heen put up to work them.

There are three shafts; the North and the South, hoth of which follow the vein, and the Pacific shaft, which is vertical. The latter has three compartments, two of them 5x4 feet and the third 5x3½ feet, the excavation being 16x7 feet, carefully timhered with 12x12 in. and 12x14 in. pieces. This shaft is equipped with superior hoisting machinery. Self-dumping automatic skips are used, hoisting 3,000 pounds of rock each, with English flat wire cables. The derrick frame is 76 feet in hight. On the Pacific claim the levels are as follows: No. 1 is 1,060 feet below the surface; No. 2, 1,157 feet; No. 3, 1,237 feet; No. 4, 1,310 feet.

Level No. 5 will he opened during the coming summer. On the Empire the levels are designated according to their depth. The lowest, denominated the 1280 level (the measurement following the North and South shafts which incline), is about 1,100 feet vertical.

Very little trouble is experienced from water. No pump is needed. A hucket running a few hours each day keeps the mine clear.

The two mills have an aggregate of 120 stamps, and are located about 1,000 feet apart. The Empire mill has 80 stamps, and the Pacific 40. The latter are the heavier, weighing 900 pounds each. Both mills are in excellent condition, and together are crushing about 250 tons of rock daily. Connected with the mills are 40 Frue Concentrators for saving sulphurets.

A matter of interest to many miners will he to see at what small cost the mining and milling, particularly the latter, is carried on. Duriug the year, hoth mills have been run with regularity, crushing in the aggregate about *eighty thousand* tons of ore. The average yield of gold was $13 to the ton. Deducting from the operating expenses the value of material on hand, and unusual outlay in reconstructing Empire Mill, etc., the cost of production is shown to be as follows:

	Per ton.
Cost of mining	$3 20
Cost of milling	48
	$3 58
Add cost of saving and reducing sulphurets	21
Total average cost	$3 89

This company is now paying larger dividends than any gold mine in North America. The country ahout Plymouth where the mines are situated is quite unlike that of most mining sections. Instead of harren rock or desert, there are fine farms, vegetahle gardens, cultivated fields and pleasant woods, making it desirahle for residence. It is in the foothills of the Sierra, 900 feet ahove sea level, comfortahle in summer and not too cold in winter. Notwithstanding too great depth the mines are looking hetter than at any previous period of their history.

Mica.

One of the most abundant minerals in Nature is mica, as it is found disseminated in small particles in many of the common rocks. Commercially, however, it is of no value unless found alone, and in sheets of good size; and, moreover, these sheets must he clear and free from stains. Miners are apt to think that sheet mica is rare and valuahle, which is by no means the case. One mine in North Carolina produces ahout all that is used in the United States, and its owners control the market. The blocks from which the sheets are split are large, and the sheets are clear and white. Stove manufacturers and others prefer to huy sheets of standard sizes trimmed ready for use, so that miscellaneous lots do not stand much chance in the market.

It is for these reasons that none of the many deposits found on this coast have ever proved profitahle. The purchasers want a certain kind and certain sizes, conditions which the owners of these claims did not fulfill. Therefore they did not get the prices anticipated, and the enterprises fell through.

There have been sent to this office at different times during the past ten years, very many samples of mica, most of them, however, of comparatively inferior quality; that is when we take into consideration the really fine quality of known worked deposits. None of the mines here have, for some reason, ever heen opened to any great depth so as to really find out their value. It might be that when opened properly the quality of the product would he of an improved character, and such as would make it readily marketable.

The following include the principal localities at which this mineral has heen found in California: At Gold Lake, Plumas county; in El Dorado county; Ivanpah district, San Bernardino county; near Susanville, Lassen county; and at Tehachapi Pass, Kern county; it having heen observed at many other places in the State. As little or no work has been done on any of these deposits, not much can he said in regard to their probahle value, one way or the other. We have reports of mica heing found in nearly all the Pacific States and Territories; also in those contiguous to the Rocky mountains; its occurrence in some of these heing abundant, and extending to many different localities.

PLENTY of water has been struck at Quijotoa. The mill will soon be up.

Sanitary Engineering.

This is a hranch of the profession of civil engineering, which has only heen recognized of late, but it is destined to become more prominent in the future, and to he better appreciated. The ventilation and warming of huildings, sewerage, drainage, etc., are all questions of every day life that should be intelligently considered hy trained men, and not left to mere workmen who have only slight knowledge of the principles involved in carrying out good work. We frequently read accounts of elahorate arrangements for the ventilation of some large building which are to result in perfection, hut which, when put to the test, prove an utter failure; draughts exist in all directions, and the places are alternately too hot or too cold. As regards our private dwellings, the discomforts of defective warming and ventilating are still more apparent. It is seldom found possible to maintain an ordinary room at an even temperature; elaborate means are sometimes provided for the exit of foul air, but, heyond the cracks of doors or windows, no provision is made for a supply of fresh air, the natural result heing "down draughts" by ventilators and chimneys through which the vitiated air should he passing away.

Then as to drainage, although in the present day we are fully alive to the necessity of providing means for the quick and efficient removal of sewage and dirty water from our houses, and, although this is perhaps fairly well carried out in modern houses of the best class, yet it is rarely attended to in the great majority of dwellings. The drains are frequently laid so as to afford lodgments for solids passing into them, and ventilating pipes, if they are provided, rather convey a supply of foul air from the drains into the house than take it away, and, in the large majority of houses, the same water cistern serves for the closet and for drinking purposes. These and many other evils have been pointed out from time to time by sanitary engineers, hut stingy owners and apathetic or ignorant occupiers do not recognize them as they should. There should be laws for enforcing a proper care of sanitary arrangements in houses. There are many questions for sanitary engineers to deal with, and their skill should he more frequently brought into practice than is the case.

Estimation of Slags.

In the early stage of smelting at Leadville great difficulties were encountered at most of the works in making a good slag, and the "muscular" method was frequently adopted to free the furnaces from sows. This evil was in great part due to disregarding the alumina contained in the ore, and also to the manganese which was not regularly determined on account of the tedious methods then in use. The result of this oversight was a very hasic slag which would naturally close up the furnaces. Mr. T. Macfarlane in a paper read hefore the American Institute of Mining Engineers, suggested that by determining the specific gravity of a slag a clue might be found for improving it, if not correct. If the specific gravity was higher than the typical slag, this would prove an excess of the hases of the heavy metal in the faulty one. But whether it required an addition of lime, or silica or hoth, the determination of the specific gravity could not show. In the case of a slag which is far out of the way, correct chemical analysis alone can give us information, but this involves delay. Since the introduction of more rapid volumetric methods for the determination of manganese, and the estimation of alumina or slag computations, all trouhles of this nature have ceased. A fact to which Dr. Iles, of the Grant Smelting works first called attention, and which Mr. O. H. Hahn thinks might be turned to account in correcting a slag, is the behavior of its powder under the magnet. Some slags are highly magnetic, while others are not. This would seem to indicate that magnetic oxide is dissolved in the slag which has escaped reduction to ferrous oxide, and this causes a waste of precious flux.

DURING the recent warm spell some of the placer miners in the Little Rockies washed out $7 and $8 worth of gold dust per day.

FIFTEEN men are employed in getting out ore in Cerro Gordo, Inyo county, which is shipped to this city for reduction.

New Single-Acting Engine.

We illustrate on this page a single-acting engine made by the San Francisco Tool Company, at First and Stevenson streets, in this city. This engine is fitted with a piston valve between the cylinders, and corresponds in most respects to the Elwell and Packer or Chandler type made in England. It is proposed, however, to abandon the piston valve and some other features in a new set of designs now being prepared. An oscillating valve will be employed on the larger sizes, and a rotary valve on the smaller sizes.

These engines, which have come to the front mainly through the Westinghouse Engine Co., of Pittsburg, are an American invention, beginning with what was called the Hicks' engine at New York about twenty years ago. For some strange reason the art, so to call it, has been abandoned here and taken up in England, where for twelve years past such engines have been made. There are now at least seven firms in Great Britain making single-acting engines. The principles or method of their operation is quite simple, and there is no departure from common practice, at least none that should class the engines with the rotary or other irregular modifications.

Instead of one, two cylinders are employed and steam used in one end only of each. This causes all strain to fall in one direction and dispenses with play or lost motion. The cranks are enclosed in a close casing, and this being partially filled with oil, the latter is "dashed" into all bearings, and also into the cylinders, so that lubrication in the common sense is dispensed with. There are no packing glands about the engines, and their speed can be twice as great as that of double acting engines.

The Hicks' Engine before named contained nearly all the main elements of single acting engines as now made, the principal difference being that the pistons here arranged to perform the functions of valves, and the exhaust steam has been allowed to escape into the crank chamber. Willan's engines, the next of any importance to follow here, were invented in London at the works of the celebrated shipbuilders, John Penn & Sons, Mr. Willan being employed there. The Willan engine is one of the most complete to this time, and is now made with compound cylinders when economy demands it.

Some of the main proportions employed by the San Francisco Tool Company are as follows:

D = diameter of the cylinders in inches.
d = area of cylinders in inches.

Stroke of engine	D
Diameter of main bearings	D × .4
Diameter of crank pins	D × .4
Diameter of top pins	D × .3
Length of main bearings	D × 1.2
Length of pistons	D × 1.25
Width of connection bearings	D × .5
Length of connections	D × .3
Area of parts	d-.10

We will in succeeding numbers of the PRESS, publish further views of these engines with sectional drawings to show the arrangement of the working parts.

The New River Country.

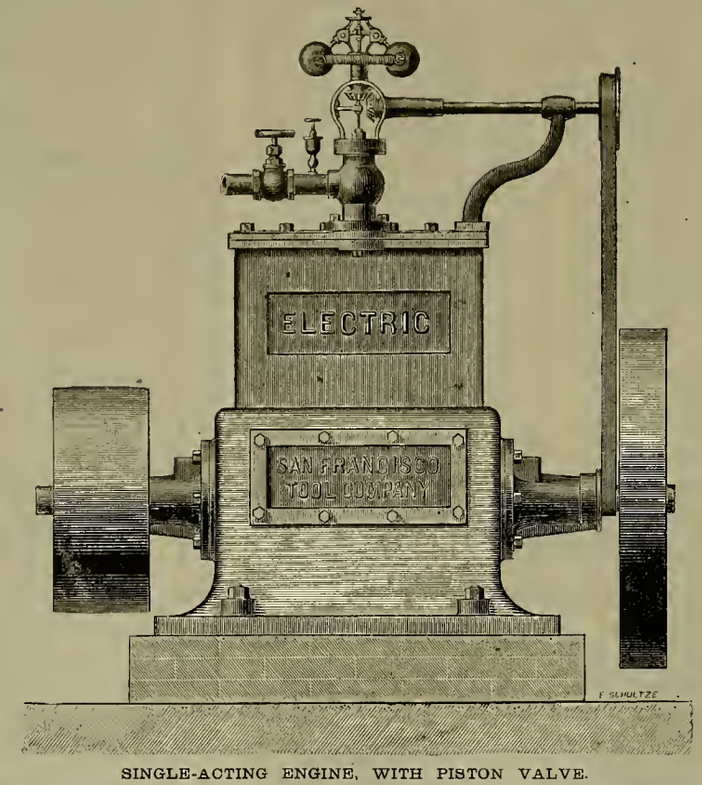
Although rather early in the season, a good many people appear to be going into this section of Trinity county, from which accounts continue favorable. Operations on the wagon road projected from Humboldt Bay to New River, are being prosecuted vigorously; such being the confidence of the business community up there in these mines that ample means have been provided to insure the completion of the road at an early day. As this road will be some 65 or 70 miles long, and its construction will call for an average expenditure of $1000 per mile, the parties undertaking it may fairly claim to have proved their faith in New River by their works. Stages are already running over a portion of the route, and will probably be able to make the entire distance in the course of two or three months, perhaps much earlier. It is stated that horsemen and even footmen can now go from Eureka to Humboldt Bay to New River without any difficulty, there being good accommodations on the way.

THE Horn Silver mine of Utah is producing as usual, but there is no disposition to increase the supply of lead or silver, owing to the present depression in these articles.

JOHN W. Mackay will shortly arrive in California.

Heat in Amalgamating Pans.

J. H. Bidwell, of Ivanpah, Cal., has patented through the MINING AND SCIENTIFIC PRESS Patent Agency, an amalgamating pan, which is so constructed that the temperature of the contents may at any moment be decided without uncovering the pan or encountering the mercury or steam exuding therefrom. The inventor claims that an excess of heat in the pan destroys a large percentage of the mercury, while too low a temperature interferes with the economical extraction of the gold and silver. The temperature, as a rule, is merely guessed at, as it is not practicable to introduce a thermometer into the agitated pulp. Under this invention a bulb is introduced into the pan, which in turn is connected with a pipe that passes through the side of the pan and terminates in an upward projecting arm. The bulb and pipe are filled with mercury, and a peculiar shaped thermometer, made expressly for this invention, is introduced into the bulb through the pipe, and can be so arranged as to have the scale of the thermometer either upon the side or top of the pan. This invention has been in use at the mill at Ivanpah for some time, and it is found to be of great benefit both as to the saving of quicksilver and silver. It has happened that



SINGLE-ACTING ENGINE, WITH PISTON VALVE.

as much as 50 pounds of quicksilver has been lost by heating pans five degrees too hot, and in the same ore ten per cent of silver has been lost by not heating it enough by five degrees. The fact is there is no ore but that will work better at some certain degree of heat, and it cannot be guessed at by 15 or 20 degrees. Mr. Bidwell's invention, it will be seen, is a very important one, and is destined to save large amounts to the mining industry.

BULLION CROPPINGS.—A party of miners have obtained from the Bullion Company the privilege of working the croppings or old upper levels of the mine on tribute. They have begun operations, and are now engaged in clearing out the old Cresus shaft, sunk in the early days of the Comstock, and which is nearly 500 feet in depth. Drifts will be started to the west from different levels in the shaft, and run into the croppings. The shaft through which they are working bears an auspicious name.—*Enterprise.*

ABOUT 12,000 cords of wood will be driven down the Carson river, during the coming season. This is about the average drive of late years, but in earlier times, when most of the ore crushing was done by steam mills in Storey county instead of by water mills on the Carson river, as much as 180,000 cords were sent down in one season.

CONSIDERABLE prospecting is going on in southern Oregon at present.

Calico District.

[From Our Traveling Correspondent.]

The District of Calico has been given more or less notice in the coast papers of late. The information, however, has been confined to strikes, output or local mention, and has not been accompanied by the necessary details to properly enlighten one at a distance as to the camp's claims as a silver producing district, formations, etc. The expert who visits Calico for the purpose of correctly describing the formations, analyzing the indications, and predicting, with the least certainty its future, will find himself up a tree, so to speak.

Strange Formations.

It has been said of man: "Thou art fearfully and wonderfully made." Man is not a circumstance in comparison with the formations and composition of this district. The mountain range, across the southwest face of which the mineral belt lies, is a strange commingling of strata and mounds of many-colored formations; hence the name of Calico. The district is from one to three miles wide and about eight miles in length. The mountain is barren of vegetation is rugged and cinder-like in appearance. The hills indicate having passed through a volcanic tussle that left them in a condition strangely at variance with nature and perplexingly mysterious to the average mining expert. Porphyry, spar, porous quartz, sandstone and sedimentary formations constitute the principal argentiferous orea of the district, spar veins predominating and yielding the highest grade.

Irregular Vein Matter.

There is little or no regularity in veins. No true fissures have been found nor is it reasonable to expect the existence of any, unless it be at a great depth. Slides, broken masses of sedimentary matter, birds-eye porphyry, spar veins and country rock, abounding in pockety ore-chambers and chimney-like deposits of ores that assay from $10 to thousands per ton, is the order rather than the exception of things. The ores are all free milling. Owing to the non-existence of water or any moisture whatever, little or no timbering is required. The broken up and irregular formation, in most parts of the district, necessitates less powder than is usually used in silver mining districts.

The Mines.

The district rules prescribe the size of a claim to be 1200x600, being 300 feet on each side of the vein. The entire belt has been gobbled up, some of it a number of times, and the usual litigation characteristic of a new camp, make work for the courts. The majority of the district is held by locators who are non-residents, or miners who lack capital to properly or successfully develop a silver mine. Prospectors and mine owners here, as always is the case, want thousands for their prospect holes and thus keep out capital that is ready and anxious to pay fair prices and develop the good mines. There is not a patented claim in the district, and until order and satisfactory adherence to location laws are better established, titles to property will be questionable.

Tribute Miners.

Men who work a mine or part of a mine, taking the proceeds as wages, after royalty deducted, but who work under the direction of the owners, and hold no possession or title as lessees, are legion here. With the exception of a few companies, all the mines are worked by chloriders or tributers. Small claim owners, working their own ground, come under that head in this case. These men furnish their own supplies, extract, sort and sack the ores. Freighters haul it to a custom mill or to the sampling works at Daggett, some five miles distant, charging them $4.50 per ton. They take out from one to five tons per day, according to the number of men at work or the character of the ground and ore in which they are at work. The following schedule of prices paid for ores delivered at the railroad station at Daggett, will inform the mining man what can be realized by tributers:

Oz. Ore.	Cents per Oz.	Price per Ton.
40	48.19	$ 19.27
50	53.98	27.00
60	58.81	35.28
70	62.65	43.85
80	65.54	52.43
90	67.47	60.78
100	69.40	69.40
150	73.20	109.81
200	77.19	154.20
250	78.08	195.20
300		246.36

The Silver King.

To know the King is to know the district. The mine is properly named, and is all that the name implies, in the way of a bullion producer and dividend-paying bonanza. The mine is owned by Milwaukee, Wisconsin capitalists—C. M. Sanger, president, and C. T. Bradley, treasurer. The superintendent, Mr. D. Bahten, is a thorough miner, a progressive, systematic and economical manager, and is familiar with the many and perplexing formations of the entire district. The mine is paying monthly dividends of from $15,000 to $30,000 per month. Since January 1, '84, over $1,000,000 in silver bars have been shipped from their mill, all of which was taken from the King. The Silver King is situated at the head of Main street, in Calico, is 1,200 feet long, and is so shaped as to be 400 feet wide at the north end, and 150 feet at the south. The company own the Queen, and control the Moscow and Little Bonanza on the north, and own the Snow Bird in East Calico. A well defined foot-wall extends across the face of the King grounds, cropping out near the top of the claim, no great distance from the summit of the mountain. In keeping with other strange features of the district, the wall dips with the hill, and not into it like should naturally do. The dip is about 70 degrees, while the surface is about 40. A winze has been sunk on the wall from the first to the sixth level; a 415-foot tunnel from the surface taps the wall on this level. A winze at each end of a 200-foot drift on the foot-wall, each side of the tunnel, connects with the seventh and eighth levels, and one winze goes still 50 feet below the eighth, making a depth of 550 feet reached on the foot-wall.

Development of Ore Bodies.

The richest ores of the King have been taken from porphyry and spar veins of irregular shape and uncertain length and thickness. Some of the country rock also has been found to be more or less mineralized. Chamber, bunch and pocket deposits have been and are being discovered daily, notwithstanding the uncertainty of the veins' permanency, as rich and higher grade ores have been found often but a few feet from where lost, and in formations that puzzles the miner to account for the existence of such strongly congenial, geological neighbors. Ores running from $15 to $45 are mixed, and the many rich antimonial and horn silver pockets make the average run from $30 to $45. The company's mill is at Daggett, seven miles distance. Two 20-mule-teams of three wagons, each deliver 60 tons of ore daily at a cost of $2.50 per ton. The cost of mining, hauling, milling and discount is about $18 per ton. The tunnels, drifts, stopes and winze excavations will measure nearly a mile. The air is good, though somewhat warm in the deeper levels. A whim, to be run by horse-power, is to be put in on the sixth level west of the main tunnel. The work throughout the mine is done mostly single-handed, more than one man in the breast of a tunnel or drift being an exception. About 40 assays per day are made in keeping track of the different vein matter and ores taken out.

Wages and Supplies.

This company pays $3.50 per day, working nine hour shifts night and day week days and even Sundays. Men are at liberty to board where they please, promptness and sobriety only being required by the company. The warmer levels assist in consuming an extra number of candles, about one ton per month being used. The water supply for drilling and drinking purposes is quite an item in the monthly expense bill. There is a great deal of dust in the main tunnels and drifts, and an ore car raises a cloud in its passage in and out, that the uninitiated would think must be unhealthful to miners. The timber for lagen, posts, chutes, skids and tramways is brought from Flagstaff, Arizona, and the cost is no small item. Miners receive their pay from the first to the tenth of each month and something like $20,000 is paid out in Calico every month.

West Calico Mines.

The leading mine is the Sue. The claims of the company lie northwest of the Silver King, and they claim to have formations and ores similar in character and richness to the King.

(*Concluded on page 180.*)

Concerning Strikes.

The country is now experiencing its periodical epidemic of strikes. The continued hostile attitude of the Hocking Valley miners, the strike of the employees of an agricultural establishment at South Bend, and the iron-workers of this city and at various other points, may be regarded as symptoms of a general dissatisfaction among the laboring classes throughout the country. Fortunately the trouble in this city has been settled amicably for the present at least.

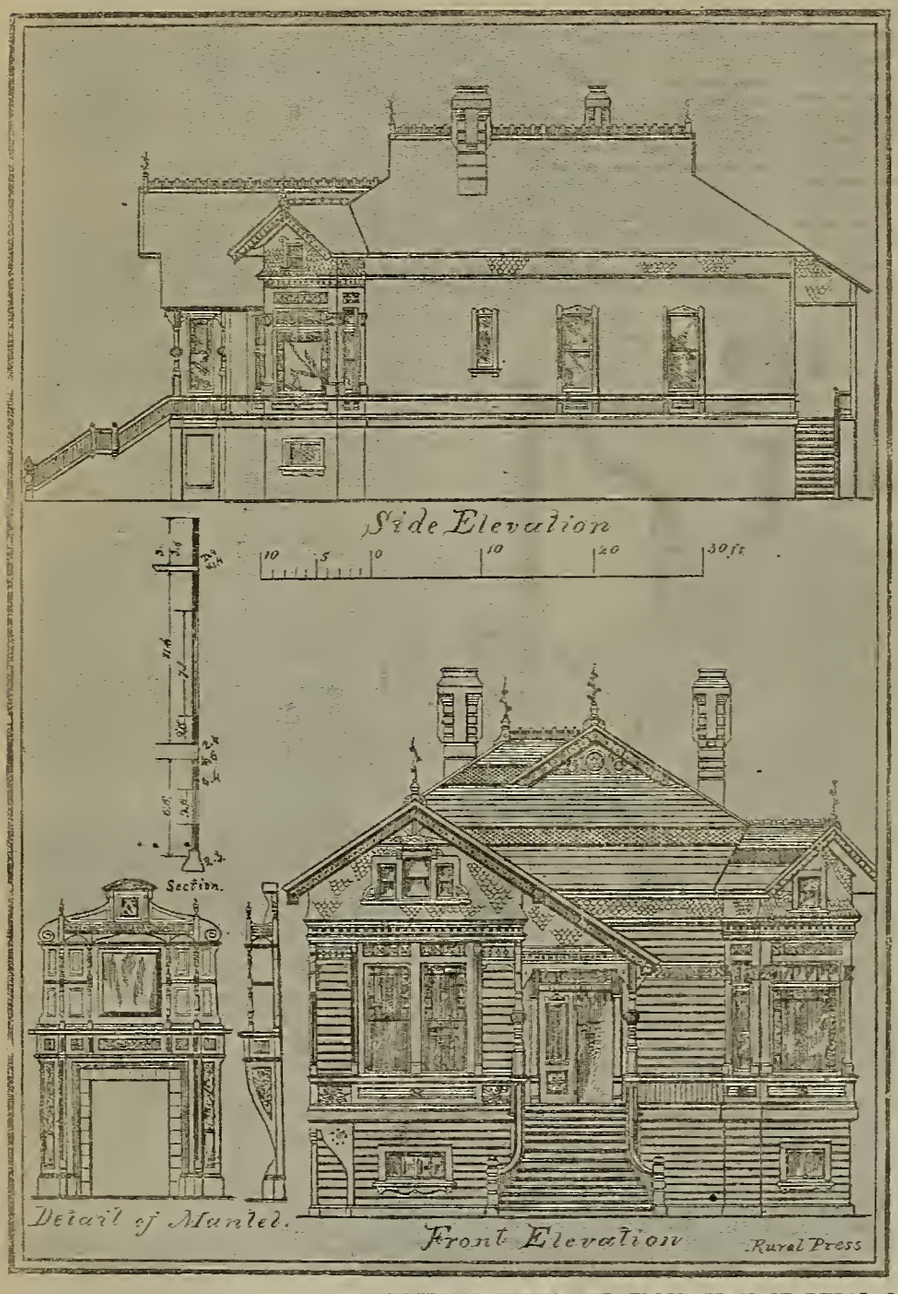
There is, indeed, something pathetic in a strike to resist what would seem to be a cruel and unnecessary reduction of wages that touches the general heart of sympathy; but there is a time when strikes are fatuous and almost certain to end in failure. When there is a general depression in business, when profits disappear and capital is running at a disadvantage, the wages of the laborer must share with the employer's losses. They must be adjusted to the downward slide. This is absolutely necessary in order to keep business going. To organize a strike to keep wages up in such a state of things is injudicious, for it is almost sure to result in a retrenchment or stoppage of business and general distress. As the cause of the depression is universal, a change of place in search of employment offers little or no encouragement. And yet very much of the distress and disaster that laboring men bring upon themselves is owing to the fact that they blindly follow leaders who fail to study the indicators of the temperature of trade. Labor, like any other article in the market, is governed by the law of demand and supply. When it is scarce, wages are high; when it is in excess of demand, as it usually is in hard times, the prices fall, and any attempt to enforce a fixed and uniform standard through all the fluctuations of trade is simply fighting the inevitable. And yet, strange to say, this is one of the frequent blunders of the trade-unions that the men are "ordered out" on a falling market, when the "bosses" are well-nigh indifferent whether the works shut down or not, and when at the worst strikes can be of no serious detriment to them. Indeed, they are often so glad of an excuse to curtail or temporarily suspend business as to create the suspicion that they find ways to mislead the judgment or tamper with the integrity of the leaders of the guilds.

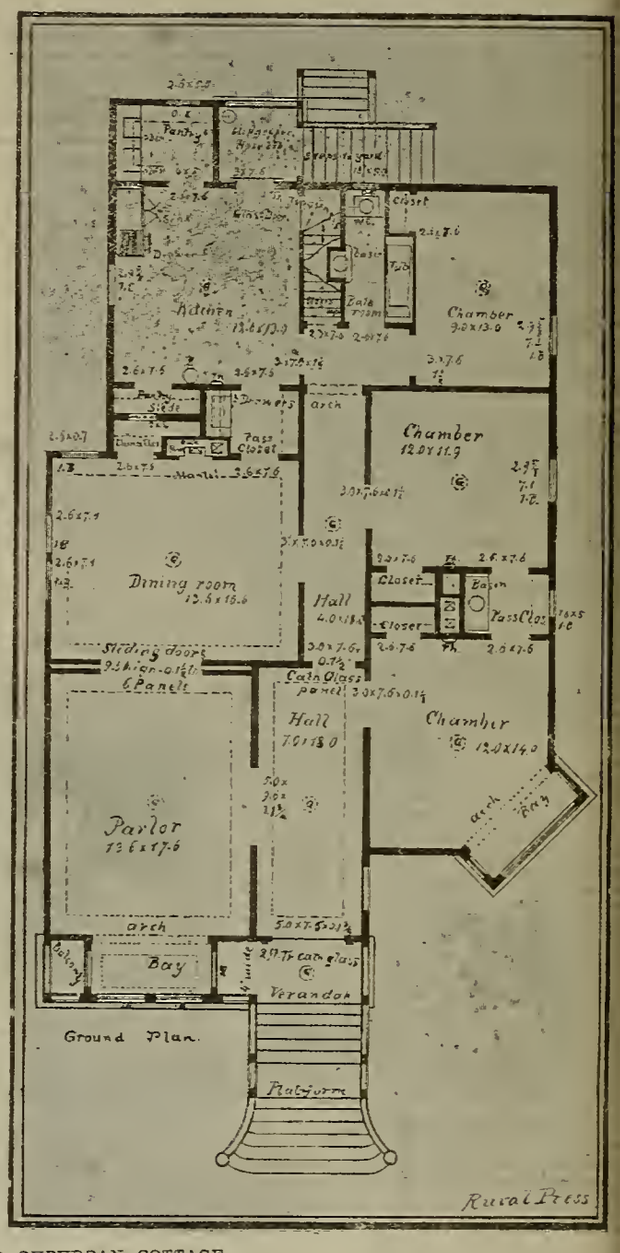
But when business is active and profits are advancing, the laborer certainly has a right to share in the thrill of prosperity. Some employers are apt to be slow in recognizing this right. They may be anxious to make up for the losses of former depressions, or may be inclined to regard the wave of prosperity as uncertain and temporary. Others are careless, indifferent or too stupid to realize that with an increase in business comes an increase in the prices of living: and a few may be too cold, hard and selfish to do anything towards lightening the burdens of the laborer. Under such circumstances working men are forced to combine for a readjustment of wages, and are justifiable in so doing and usually succeed. Employers cannot afford to pause, daily or stop work; the demands are urgent and the profits too great. Then the general increase in business opens fine opportunities for workmen elsewhere, and it would not do to higgle with them very sharply as it would be difficult to supply their places should they get petulant and leave.

When laborers strike for higher wages because they cannot subsist on what they have been receiving, they are sure to have the sympathy of the community; but when, as in the case of the Hocking Valley miners, they strike in obedience to the arbitrary and unreasonable commands of their leaders, or, perhaps, the league, the insurrection of labor against capital loses much of its pathetic aspect. The miners were receiving good wages, but the rules of the Miners' Association are, that if a capitalist makes a profit of more than twenty-five cents per ton, he must share one-half of the excess among the laborers. The miners were not in want. The capitalists were supposed to be making more than twenty-five cents a ton. They struck for a division of the profits in excess of twenty-five cents per ton. Had the capitalists only been making twenty-five cents a ton, they would have remained satisfied. Now, if this is a correct statement of the case, it is a principle of industrial economy that is, at least, questionable. Strikes for an advance of wages, or even against a reasonable reduction on a falling market are of doubtful expediency, but under no circumstances are they justifiable in order to compel a division of the profits. It is an arbitrary and despotic proceeding that smacks of the worst phase of communism. There is not the shadow of just principle involved. The Miners' Association says that fifty cents a ton is good wages for the miner, and that twenty-five cents a ton is good enough profit for the mine owner. Now, if this is so, then if the capitalist makes forty cents per ton after paying the miner his fifty cents per ton, the extra fifteen cents per ton does not belong to either of them, but to the consumer. This introduces a third element into the equation which the laborer seems not to have duly considered. In striking for one-half of this extra profit they strike for a share in unjust plunder: they seek to become partners in wrong along with the capitalist. If, instead of striking for a share of the plunder, they struck to make the capitalist sell cheaper to the poor consumers in our large towns and cities, there might be a show of plausibility in the undertaking. But they strike for themselves, not humanity; for more money, not for a better state of society; not because labor was poorly paid, but because they are as unscrupulous as the capitalist, and would have an interest in his extortionate gains. We speak of the Miners' Association, for the rule sought to be established there is sought to be established in other industrial enterprises.

No, not in this way can the ugly chasm between labor and capital be bridged. The capitalist will continue as grasping as ever, and the laborer suffer the bitterness of defeat. Some other method of disposing of the controversy must be discovered. The appeal to brute force has always proved weak and unfortunate. More intelligence, far-sightedness, mutual justice and kindness must solve this problem if it is ever solved. W.

TIMBERING IN A BOTTLE.—In Frank Frederick's window is a curiosity that shows the mechanical ingenuity, patience and perseverance of man. A large bottle, with a very small neck, contains an illustration of how timbers are put up in the stopes of the Comstock mines. The floor, sills, posts in fact everything that can be seen in a mine can be seen in the bottle. All the pieces are carefully and mechanically joined and it must have taken a world of patience to have placed everything through the neck of the bottle and then fastened the same together. It is the work of a carpenter at the Union, named Willeson, and will be sent to the New Orleans Exposition by C. C. Thomas. It will remain here a few days, and it is well worth while for a person to take a look at it.—*Virginia Enterprise.*





EXTERIOR VIEWS AND FLOOR PLAN OF RURAL OR SUBURBAN COTTAGE.

Cottage Design.

We give on this page a cottage design, front and side view and floor plan, of a beautiful cottage, suitable for a rural or suburban situation. The design is reproduced from the new architectural work entitled "Picturesque Californian Homes." by Samuel and J. C. Newson, architects, San Francisco, which we offer to our subscribers on very favorable terms. It has many designs, and something can be found in it to suit nearly all tastes and purses.

HAD all the silver produced by the mines of the United States been coined into standard dollars for the last fiscal year, it would not have added more to the specie circulation of our people than seventy cents per head of our whole population.

Engineering Notes.

The Sukkur Bridge.

The Sukkur Bridge, India, contract, the ondon, *Engineer* says, has been let to lessrs. Westwood & Bailie, Isle of Dogs. bout a year ago this bridge was offered for ender, with the extraordinary condition that ie immense cantilevers were to be erected for spection at the works of the maker in Engnd. Few makers were able to tender in this ay; but some of the more enterprising offered o take the responsibility of the work going ogether properly in India by erecting it at the te. The business was postponed till now, ending communication with India. The authorities there prefer to erect the bridge themselves, f, therefore, the original plan of erecting at he factory be carried out, the cantilevers will resent a somewhat startling spectacle on the anks of the Thames. It will be interestiug to ote if Mr. Roudel will carry out the design as was described last year. It is, however, lmost impossible that such a hideous thing ill pass into actuality without important modfications: but in any case the Sukkur Bridge, ven as far as it has yet gone, is an illustration f the way England is officially committed to he greatest barbarisms of design when design s thrust upon officials as a matter of routine, nstead of being solicited from those who have pecial talent in the work to be done. Moreover, if it becomes necessary to erect all the ew bridges in the factory yard, bridge builders ill have to buy a county for erecting room, to ay nothing of the enormous extra cost and aste of money. Perhaps, however, the designrs will learn to predicate the capability of their ridges to stand without erecting them twice.

A New Style of Paving Block is composed f a hollow iron shell filled with any desired oncrete. The shells are arched underneath, nd for street paving are about 4 inches wide nd from 10 to 12 inches long. The blocks, or lled shells, are laid against each other upon he prepared roadbed, and the form of the botom compacts the sand underneath, making the hole structure very firm and solid. The surace of a street paved with these blocks would e about as smooth as if paved with asphalt, nd it is claimed, apparently with good reason, hat the pavement is much more durable if the oncrete should become broken upon its upper urface the wheel could only wear it away to a epth of less than a quarter of an inch, as at very interval of four inches there would be preented a surface of chilled iron upon which the ire would ride all the time. We have before eard it suggested that iron would make a good avement for streets, but the invention we have oticed is the first practical attempt to use it or that purpose of which we have any knowldge. The patents upon this paving block are wned by a company in a Western city.—*Am. Manufacturer.*

Ocean Cables.—To lay a cable across the Atlantic is an enterprise which requires skill as well as capital. So many obstacles have to be ncountered, and so many accidents are liable o happen, that the risks of cable-laying, when onsidered, appear formidable. For instance, he steamer *Faraday*, which is used to place he cable, costs $5,000 per day. One of the ables laid by Messrs. John W. Mackay and ames Gordon Bennett, divided, and this vessel as employed six weeks in grappling for it before the ends could be secured and spliced. It s stated in an Eastern journal that Mr. Bennett's share in the venture has required $7,300,000. Presumably, Mr. Mackay has got as much in the enterprise.

A Canal Across Michigan.—A canal is proposed across the lower portion of Michigan, to connect the waters of Lake Michigan with those of the Detroit river. A hill has been reported favorably in Congress appropriating $10,000 for the preliminary survey. The distance between the lake and the river is 178 miles. Mr. Henry Willis, who was connected with the construction of the Pennsylvania canals estimates the cost of the proposed water route at $4,754,860. He says the distance saved between Detroit and Chicago by a canal would be 535 miles, and that an annual loss of between $2,000,000 and $3,000,000 now incurred by commerce upon the lakes would be avoided.

About the most remarkable piece of engineering work that has come under our notice lately was a steam boiler set in sandstone. The blocks of stone were neatly dressed, and the work looked very fine outside, but the furnace, and the pier supporting the back end of the boiler, seemed to be in about the same condition that the eggs were in at a certain hotel where a guest ordered them poached, and the waiter strongly advised him to have them scrambled, "for," said he, "them aigs ain't very fresh, boss, and dey *look* better scrambled!"—*Locomotive.*

A General Subway.—It is proposed to build a general subway under all the principal streets of London. The cost of such an enterprise would be considerable, but the benefits derived from it would, in the end, more than pay the cost. The architectural and scientific papers speak approvingly of the scheme.

Useful Information.

Castor Oil for Shoe Leather.—There is one simple article which will render any decently made boot thoroughly impervious. It is nothing more nor less than cold-drawn castor oil, "pure and simple." It is best applied before a moderate fire. The boots to be dressed should be quite clean and dry, and special care should be given to the welt and the tongues, and their stitching to the upper leathers. I generally begin by pouring the oil from the bottle all around the welt so that the angle between the sole and upper leather is quite filled with oil, and then proceed all over the boot, including the edges of the soles, rubbing it in with the hand. When one is done, have a turn at the other, and so alternately till you have got in about a tablespoonful and a half to each boot. The tongues being thinner leather, should be quite saturated. Subsequent dressing will not require so much oil. I have never found anything to touch this as a waterproof dressing; the gelatinous oil seems to effectually stop every pore in the leather. There is no other advantage for those who are natty in such matters—the boots will soon take a good (common blacking) polish—so much so that a man may, if he likes, waterproof his ordinary walking boots for bad weather without spoiling their appearance. With a common walking boot of ordinary thickness apply the oil over the sole. Shooting, I wear boots so treated over thick woolen socks, from eight to twelve hours a day, or more, without feeling the slightest inconvenience in any way; but they have the chilly feel inseparable from all boots that are oiled in that way.

Common Sense Ventilation.—The best practical statement we have met with about ventilation is contained in the following remarks of a mining engineer: "Air is like a rope; you can pull it better than you can push it. All mechanical appliances for pushing air into a room or house are disappointing. What we need to do is to pull out the vitiated air already in the room; the fresh supply will take care of itself if means for its admission are provided. It has been usual to withdraw the air through openiugs near the ceiling—that is, to carry off the warmer and therefore lighter portions, leaving the colder strata at the bottom of the room, with their gradual accumulation of cooled carbonic acid undisturbed. Much the better plan would be to draw this lower air out from a point near the floor, allowing the upper and warmer portions to descend and take its place. An open fire, with a large chimney throat, is the best ventilator for any room; the one half or two thirds of the heat carried up the chimney is the price paid for immunity from disease; and large though this seems, from its daily draft on the woodpile or coalbin, it is trifling when compared with doctors' hills, and with the loss of strength and efficiency that invariably result from living in unventilated apartments."

A Human Furnace.—The Gridley *Herald* states that a tramp recently entered that office, who said he was known in side-show circles as "The Human Furnace," because of the peculiar properties of his breath. To prove his claim to the title he lit a match by blowing his breath on it; set fire to a piece of paper, and singed the hairs on the back of our foreman's hand in the same manner. But the best test of all was when he lit a kerosene lamp three feet distant from him by blowing his breath through a piece of stovepipe on to the wick. He was unable to explain his peculiar faculty, further than to assert that he became possessed of it while a child, when he was ill for several years, and the physicians gave him large doses of sulphur.

A Living Infernal Machine.—The San Diego *Sun* relates a very extraordinary occurrence which took place recently at the residence of one of the prominent citizens of that city. The family were sitting in the parlor, in the evening, when a bug was seen crawling on the table. One of those present seized the insect and placed it in the lamp, with the view of cremating it. A loud report was instantly heard, and the lamp chimney was blown to atoms. The explosion was certainly connected with the insect, but in what manner, says the *Sun*, we leave to scientists to explain.

How Bricks are Handled in Germany.—There are no hod-carriers in Germany. Bricks are passed from hand to hand. The higher up the bricklayers are, the more men are required to toss the bricks. Two men to a story is about the average, with enough more to lead from the front of the building to the place where the bricks are needed. One may sometimes see three men on the ground, eight on the front of the building and five on top, making sixteen men through whose hands each brick passed before it reached its place of destination.

Gun Cotton as a Motive Power.—An application of gun cotton is said to have been made in such a manner that it will eventually supersede the use of steam for the purposes of light locomotion and driving small machinery. Details of the invention are not yet made public.

Antimony in Clothing.—Among other poisonous substances used in dyeing is antimony. A French industrial journal records the fact that an appreciable quantity of this mineral is often found in cotton yarn, which is dyed with aniline colors, and remarks that unless great care has been taken in cleansing the yarn, it is possible for such a quantity to remain, as to be seriously injurious to the skin, especially in the case of stocking and any other aniline-dyed garments which may be worn in contact with the skin.

The Most Nutritious Grass. Chemical analysis shows blue grass (*Poa Pratensis*) to be the most nutritious of all the grasses. According to this test, five pounds of blue grass contain as much flesh and bone-producing elements as 10 pounds of timothy, 6 pounds of red top, or 6 pounds of orchard grass. Owing to the much greater yield of the latter, however, it is undoubtedly the most profitable that can be grown upon soils adapted to its production.

Compressed Camphor is made by Wm. F. Sines & Son, patentees, Philadelphia. Refined camphor compressed into one-ounce cakes rendered compact and solid, which prevents rapid evaporation, are handy for dispensing. Refined flowers of camphor remains in fine powder is what is wanted for manufacturing purposes and dispensing. Packed in air-tight packages for home and export trade.

A New Porcelain. Mr. Lauth, the superintendent of the porcelain factory at Sevres, is said to have discovered a new porcelain, which is far superior to the celebrated old Sevres. After ten years' experiment and investigation, he thinks he has produced a porcelain identical with that of China. Not only does it lend itself to artistic decoration, but it takes all kinds of glazes, and surpasses in beauty the colors obtained in China.

A Foot-Warmer for railway carriages, heated electrically, is being tried in France. The system is devised by M. Em. Concallas and M. Aeph Elu, the heat being produced by a current passing through lead plates transversely arranged in the ordinary foot-warmer. In the recent trials which have taken place, the current was developed by a Gramme machine and traversed five foot-warmers.

Discarding the Horse Bit.—It is said that Australians have discarded the horse bit, and substituted for it a contrivance, consisting of a steel band placed over the front bone of a horse's nose, to which appliance the reins are attached. It is claimed for this substitute for the bit that it gives complete control over the horse, without inflicting the least discomfort or torture.

Good Health.

That Sanitary Inspectorship.

Editors Press:—It is a very odd thing that with all our professed affection for our children we really take so little care of them. When a plague threatens our orchards we raise a breeze strong enough to start the legislative windmill, and a crop of hug inspectors results. Sheep get scabby, and scab inspectors are called for. But our

Children Get Poisoned

By the thousand, and hardly a voice is raised to suggest an inquiry; let alone any mention of appointing an inspector to abate the death-dealiug nuisances whence the poison emanates.

The fact is we are miserably miserly and selfish. Our sheep have a cash value; our orchards have a cash value; so we can't suffer them to perish. Our children are a source of expense, and call for parental self-denial, so our women "doctor," and unnaturally wrong the unborn, and our babies are "soothed" to death with some cursed "syrup;" or a filthy privy, as "I. H." writes, and as I have written dozens of times, poisons air and water alike, breeding diphtheria and zymotic diseases innumerable.

Let our legislature now convened signalize its session by appointing a "Sanitary Inspector" and making it criminal to poison God's air and water with filthy cesspools.

Edward Berwick.

Laying Down Rules of Life.

A thoughtful writer in the *Herald of Health* observes: "It really seems sometimes as if hygienic science were all wrong, and as if late hours, much hard work done under the gas-light, and the smallest amount of fresh air were the way to be healthy, if not wealthy and wise. Who lives under more unhealthy conditions than our legislators or the leading counsel learned in the law? But our statesmen are in a green old age at 75, and lawyers are quite boyish at 60; so, too, are actors and actresses." Our contemporary then goes on to say. "Sanitary guides should tell us the meaniug of these things."

"So far as we may presume to respond to this appeal," replies a physician in the same useful journal, "we must be allowed to point out, first, that there is a fallacy in the inference that because members of Congress, busy counsel, and, perhaps, actors and actresses, live on in spite of the adverse influences of surroundings which are held to be injurious to health, therefore the surroundings of their lives cannot be as injurious as they are supposed to be.

"One of the earliest exploits in the applied science of statistics as brought to bear upon sanitary questions was the drawing of an inference that, because the London night men, who slept as they might by day, and spent the hours in darkness in emptying cesspools, were able, as a class, to claim a low rate of mortality, their mode of life and the work in which they were engaged could not be unhealthy. A good deal of excitement, we remember, was produced by this delivery some 40 years ago. It was forgotten that another point of view was possible, and that, in truth, none but the inured could live under such conditions! So it is with members of Congress, busy counsel and actors and actresses. The weakly and sensitive retire or die, or have the wit not to enter into a way of life which must obviously prove unsuitable. At the same time, we are quite prepared to meet our contemporary half way in his argument, though the inference with which he opens the debate is obviously faulty.

"We think a great deal of unpractical nonsense is talked and written on the conditions of health, and we are quite sensible of the fact that that regimen and dieting may be carried too far. Practitioners and those who set themselves up as apostles of sanitary science are too prone to measure other people's corn by their own bushel. For example, a physician or surgeon may himself have been a too free liver—it is easier to preach than to practice—and he may have become a vegetarian just in the nick of time or with great advantage to his health; but this is certainly no reason why he should spend the remainder of his days in trying to persuade others that vegetarianism is good or necessary for them also. Again, a medical man may have a miserably weak digestive faculty, and need to avoid certain dishes which other folk can take, not only with impunity, but with benefit; but that is no reason why he should go about abusing and interdicting the things that disagree with him, while they agree perfectly well with the majority of mankind. By pushing dieting to the verge of starvation, we are simply pretending to cure, not curing; we impose on ourselves and on those who confide in our practice."

Deep Breathing.

In this season, when coughs and colds are "all the rage," any method of preventing them, and checking the first symptoms without drugs, may be of inestimable value. Therefore the following suggestions are offered:

When you find you have a cough, and before it gets to be deep-seated, go into the air and practice deep breathing. Draw air into the lungs until they are completely distended, raising the arms above the head during inspiration to more fully expand the chest. Hold the air in the lungs for a few seconds, then breathe it out slowly. Repeat the operation a dozen times or more, and after an hour try it again.

Persistence in this treatment will often cure a newly-contracted cough in a few hours. If the cough is of long standing, pain may be felt under the shoulder-blades and across the chest during the breathing, but as this is caused by the tearing away of adhesions of the lung tissue, it will usually pass away in a day or two, and the fact that it is felt shows that the lungs need thorough inflation.

Three cases have recently come under our observation where this treatment has proved beneficial.

The first was that of a lady who had been troubled with a dry cough for several months, but whose lungs were apparently sound. In three days she cured herself entirely by deep breathing, and, although a month has gone by since then, there has been no return of the cough.

The second was a gentleman who thought his lungs were failing. Deep breathing gave severe pain, as above described, but it soon passed away. A burning sensation was also felt in the lungs at each deep breath, owing to the access of oxygen to irritated lung tissue. The cough decreased in frequency and violence, he has gained in general health, and recovery will probably ensue.

The third was the editor of the *Journal of Health*. He "caught cold," which settled into a severe cough. A dozen inhalations would stop the cough for an hour or two, when it would return and be stopped again in the same way. Two days' treatment drove it away entirely.

Sometimes the first deep breath is interrupted by a cough, but after a trial or two the inclination to cough can be controlled, and after five or six breaths are taken a sense of relief is felt and the desire to cough passes away.

A physician friend informs us that he has seen many cases of supposed consumption speedily cured in this way. At all events, it can do no harm to try it, and benefit may result.—*Hall's Journal of Health.*

Mullein for a Cough.—According to some of our medical journals, the use of mullein as a palliative for the cough from the lungs, seems to be meeting with favor in various quarters. The customary form of administration has been a milk decoction of the plant. More recently the smoking of the leaves has been recommended as a more agreeable and effective method of administration.

Keenness of Sight.—At a recent meeting of the Society of Arts in London, a paper was read on the subject of aids to the eye-sight. Dwellers in towns, it was remarked, rarely looked at a distant object, and the townsman's eyesight is hopelessly inferior to that of the average Scotch forester.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

EXTRAORDINARY STRIKE IN THE MAMMOTH.—This famous mine at Middle Bar keeps up its reputation as the most remarkable property in the county for heavy deposits of free-gold-bearing ore. Never since the rich vein was first encountered two years ago has the gold-freighted seam been entirely lost sight of. It has varied in dimensions considerably—sometimes narrowing to very slim proportions and again widening out and forming a bunch of metal of flattering size. For some time past this vein, in connection with the main body of quartz has been followed in an upward direction from the tunnel level. Last week an immense body of that peculiar black metal common to that region was struck. The ore does not carry so heavy a percentage of gold as some of the earlier strikes, but there is vastly more of it. One blast threw out a ton and a half, and in the past week from 5 to 6 tons have been taken out. It is difficult to estimate the gold-yielding properties of such ore. Mr. Nevills, whose thorough acquaintance with this character of metal has made him an expert, estimates that it will yield in the neighborhood of $5000 per ton.

MISCELLANEOUS.—The St. Louis mine near Pine Grove, owned and worked by Sidney Smith and a Mr. Reed, has greatly improved of late. The ledge has increased in size, and shows free gold to the naked eye. The owners have made fair wages by working less than a ton a day by arastra process. They contemplate getting a small stamp mill at an early date. At the Amador Queen at Murphy's Ridge another pocket was struck during the week. These pockets have been of frequent occurrence, although no regular ledge has been met with so far. Mr. Shugert, we understand has made arrangements for the construction of a large mill in Hunt's gulch.

El Dorado.

HENRY'S DIGGINGS.—*Mountain Democrat*, March 6: J. H. Bradley's flume, carrying water to Henry's diggings broke down, but will be rebuilt by April 1st. Bradley & Co. are still at work getting fine prospects. Wm. Cole and Sexton are doing well. Gus Anderson made a cleanup that pays him $6 a day. Armstrong & Roberts have a large quantity of gravel on their dump, and are at work every day. Henry's diggings is bound to be a good mining camp, both in gravel and quartz, and there is some good farming land to be had, with plenty of wood and water.

ORE.—Placerville *Observer*, March 10: Peter Gross was up from his claim in Mud Springs township the middle of last week, and reports that he has "found it big," and will have a mill on it within 30 days. He showed us some very rich looking ore, and affirmed that he had any quantity of it in sight. Pete is a live prospector.

Inyo.

WHITE HILL MINE.—Inyo *Independent*, March 7: At the White Hill mine a new tunnel was started about 10 days ago, the ledge was struck within a few feet of the surface, and the tunnel has since been run in ore all the way. Already a good quantity is ready for shipment, and is of as good quality as that lately shipped from other parts of the same mine. The White Hill is developing into a good property.

SUPERINTENDENT'S REPORT.—Superintendent's office, Modoc Con. Mining Co., Lookout, Cal., March 1st, 1885. J. W. Pew, Sec. *Dear Sir*: I am still sinking winze from the 110-foot level (South Lookout) present depth 73 feet. Ledge in bottom strong with from one to two and one-half foot of 72-ounce ore. Will start level as soon as I am down 75 feet. It is only a question of getting in coal, iron and wood when I will start up the furnace again.

Signed, F. FITZGERALD. Lessee.

Nevada.

HORSESHOE MINE.—Grass Valley *Union*, March 6: A south drift is being run on the 100 level of the Horseshoe mine, which shows a small but good ledge, the rock showing well in free gold. It is the intention of the company, when the season is somewhat advanced to put in a larger water wheel to do the pumping and hoisting, and then sink the shaft for another level, the present wheel not being of sufficient size for that purpose.

PROSPECTING.—Grass Valley *Union*, March 8: Prospecting is quite lively in this district at the present time. It is probable that some good properties will be developed during the coming summer.

PRESCOTT HILL MINE.—The prospects of the Prescott Hill mine have greatly improved of late, and there is now in the tunnel a vein of good size and excellent quality. The tunnel, which has been in the course of construction for several years, has passed into the old Betsy ground, and is now beyond the shaft that was sunk in that mine many years ago. There are good backs above the level of the tunnel, and before these are worked out a winze will be put down and another level opened. The prospects of the Prospect Hill mine are now better than at any previous period.

MINING STRIKE AND TROUBLE.—*Tidings*, March 9: In the old Wheal Betsy mine, near Osburn Hill, a very rich ledge of quartz has lately been found. The ledge averages about 14 inches in thickness, and is of as fine a looking quartz as can well be seen anywhere. It is just what the company have been running for years, and we believe the tunnel is now in nearly three-fourths of a mile. We understand that there is some kind of a difficulty in progress today about the ownership of the mine, and that the law will be called upon to quiet matters.

NEW RIVER ROCK.—Grass Valley *Union*, March 6: Caswell C. Smith has just returned from the New River mining district, and brought with him some quartz from that section. The rock is rather hard and flinty, most of the gold being on the outside in a coating of red ochre. Some of the quartz will mill as high as $100 per ton. Smith reports the ledges in that far off district small, but numerous.

Placer.

MORNING STAR.—Placer *Argus*, March 6: The Morning Star quartz mine, of Ophir, is again to the front. As a result of 28 days' run with seven men, there has been cleaned up 538 ozs., 4 dwt. and 15 gr. of gold, valued at about $7,800. This is an average of about $50 per ton.

Shasta.

EXCITEMENT.—Redding *Independent*, March 6: The mining excitement still prevails to a considerable extent. A good many prospectors and mining men are making new quartz locations and sinking shafts in numerous places within a few a few miles of town. It seems probable that we are in the vicinity of a silver ledge of remarkable richness. Further developments will prove whether they be so or not, but in the meantime the mining boom is having a good effect on the business of our town.

SILVER AND GOLD.—Shasta *Democrat*, March 6: The Silver King silver vein has been definitely traced north to a point where it seems to cross the Sacramento river a short distance south of the mouth of Spring creek. N. J. Pehrson is sinking on a claim on Oregon gulch that is promising to be good property. He has a shaft down 15 ft and a solid body of ore is coming in. Mr. Dale of the Buckeye district last week brought some fine samples from his claim in that locality. The ore not only shows free gold, but also carries a good per cent of rich sulphurets. A party of San Francisco capitalists arrived here last Monday evening and to-day took a private conveyance for French gulch. They are looking for mining property to purchase. A couple of mines in the French Gulch district were bonded to San Francisco parties last week, and are told the bonders will be up in a few days to determine what they will do with the property. Mr. Thos. Derby of the New Almaden mine and Mr. Aug. J. Bowie the well-known mining engineers have arrived from San Francisco, on their way to French gulch to examine some mining properties in that district. A strong vein carrying silver is said to have been discovered one day last week just above the Tower House by a Montana prospector. The ore resembles that of the Silver King very much. The finder is elated with his prospect. Dan O'Neal is building a new arastra that will grind from a ton and a half to two tons a day. Lately we opened up a body of quartz that is richer than any he has taken out yet. Several of our townsmen have recently located mining property up the river near tunnel two. They became somewhat excited last week at the prospects their quartz produced and straightway sent two men up to sink on a couple of locations. Many strangers, mining men and prospectors mostly, continue to arrive daily by the train. Some few go on to Trinity county, but most of them come with the intention of first thoroughly satisfying themselves as regards the mineral wealth of Shasta county. Last week Jim Mead made a discovery on the Sugarloaf mountain only a short distance southeast from Silver King. The quartz is thoroughly mineralized and has all the indications of being good silver ore, the vein appearing to be a very large one. It is possible that Jim has struck a bonanza. He has made three locations. Silver is now causing most of the mining excitement, many prospectors having turned their attention to bunting for silver-bearing veins. We are told that a number of prospectors are finding good silver traces in the Buckeye district, and several are scouring the country between Pit river and Furnaceville district, and several are also in the limestone belt north of Redding. The shaft of the Silver King mine has now reached a depth of 50 ft. They will sink 10 ft more, when drifting on the vein and stoping out the ore will commence. The vein is now over 2½ ft wide and looking better than ever before. Recent assays were $300, $400 and $700 per ton. Several Colorado and Nevada prospectors who have been here for a month past, and who have been engaged for years working in and prospecting for silver ores, say they are confident that the Silver King lode is not the only lead of that metal that runs in northerly and southerly directions both east and west of the Sacramento river. They have had years of experience in silver ores and naturally can tell the formations in which silver carbonates, bromide, etc., exist. The discovery of the Silver King lead led them to prospect and study its country formation, and they have found like formations running through the country, both east and west of the Sacramento river, parallel with the Silver King, which has already been definitely traced to a point where the vein crosses the Sacramento river a short distance south of the mouth of Spring creek. One experienced and intelligent prospector says he is confident more rich leads are sure to be discovered in these belts notwithstanding the country is low and "float" seldom seen.

Sierra.

CLEANUP.—*Mountain Messenger*, March 6: Two hundred ounces were cleaned up by the Bald Mountain Company last week. The gravel at the foot of the incline under the lava flow is very hard, and requires blasting. The lead is narrow but very rich. Only three carloads of gravel is rolled out by one man on a shift of ten hours.

Siskiyou.

PICK AND PAN.—Yreka *Union*, March 6: McNeal & McLaughlin, on Salmon river, near Oliver's Flat, last week cleaned up 160 ounces of dust, which liberally compensates them for their work, and leaves a handsome profit besides. Their claim is only one of the many rich ones in that section, a district which bids fair to supply paying mines for the next century to come. The Schroeder boys, in the Deadwood district, are working their bonanza for all it is worth. Their several ledges continue to prospect immensely rich, and it will not take them long to accumulate a fortune. Their arastra is running full time.

ON THE KLAMATH.—Yreka *Journal*, March 6: We learn that R. H. Campbell will have at least two months more water for piping at his extensive hydraulic claim in Quartz Valley, and has been doing big work ever since New Year's. At Klamath river the river mining companies have commenced getting out timbers, and preparing to put in water wheels, expecting to get into their claims earlier than usual, as there is but little snow on the high mountains to keep the stream up as late as during most seasons, with no chance of heavy freshets. The prospects of successful river mining in the Klamath during the coming spring and summer never looked more promising than at present. W. McConnell intends commencing work in his mine on the Klamath next week, by putting in one wheel and one derrick to remove large piles of bowlders in the way. He also intends seeding a large extent of ground in alfalfa, and planting over a hundred more fruit trees in his orchard at the mine. The Chinese river mining companies at Oak Bar and vicinity on the Klamath, are commencing their preparations towards reopening their claims for spring and summer work.

Trinity.

WORKING AWAY.—Trinity *Journal*, March 6: From this side of the raging Trinity we observed that those best of paying mines—the Red Hill claims of Bartlett & Evans and Lorenz & Co., were running their hydraulics and apparently doing good work. It was also noticed that Lorenz & Co. have their hydraulic elevator at work on Parks Bar on this side of the river. Mr. McKenzie returned to Redding last Sunday from a short visit to the East Fork district in Trinity. He brought with him an average of ore from Enterprise and Lone Jack mines, which show up handsomely. He informs us that Day & Moore had just finished making a cleanup of a little over $2,000 from 20 tons of their rock. He further says the mining outlook is very flattering in that district. For some cause miners, generally, are partial to the East Fork country, which is destined to become one of the richest mining districts in the State.

FROM THE NEW GOLD FIELDS.—Red Bluff *Democrat*, March 6: From a private letter received from Geo. de la Flechell, formerly a resident of Red Bluff, but now engaged in prospecting on the East Fork of the North Fork of Trinity river, we learn that new mines are being found in that section, although the weather has been unfavorable. The veins are mostly small, though generally rich, and lay along the edge of the creek. The rock is easily worked and by process of arastra pays richly. The country is rough and prospectors have to rough it. East Fork is about 30 miles northwest from Weaverville, and somewhere near about the same distance from the New River country. The country intervening between the two camps will, he thinks, be overrun with prospectors as soon as spring opens in earnest, and some good ledges will probably be uncovered. The quartz found in this section is similar to that of the famous Black Bear mine in Scott valley, and as that ledge must cross the Salmon on a line even with some of the locations made on New River, it is a reasonable presumption that the finds in that section are a continuation of the Black Bear strata. It may be possible that the discoveries in the East Fork section bear some relation to this immense strata lying to the west, as the ore is nearly identical, but from developments as yet made it would be difficult to say. The mines at East Fork and New River are not "bladder" schemes, by any means, as there is no question of the existence of rich deposits and an extensive field for research.

NEW RIVER MINES.—Cor. Trinity *Journal*, March 9: I see by the papers that some persons have been sugar-coating the New River mines too thick, and that the pill is hard to swallow. We have a few rich mines, but, as a rule, the ledges are small. I will give you a brief sketch of them, without exaggerating. Before doing so, I think it proper to caution persons who think of coming here in the spring looking for work, that they better stay away; they will be a year too soon. On the other hand, those who are on the prospect cannot find a better place. I have always said that the middle and southern mines of California are ten years ahead of the northern mines, and am certain that if one-half the money and labor which has been expended in any county of Nevada, Arizona, New Mexico or Utah had been laid out in Trinity, Shasta and Siskiyou, the parties so doing would have had 100 per cent better returns. Our natural resources are infinitely better; plenty of wood and water, and the counties mentioned not half prospected. Time will prove my statement correct. Pony Creek, on the southern boundary of the New River district, has not been much prospected for quartz. The placer mines were the richest of any creek in the vicinity. Crossing over a divide to Slide Creek, the first mine belongs to a San Francisco company, represented by H. Lang, who is running a tunnel. The prospects are good. Next is the Mountain Boomer, one of the first locations made in the district. The ledge is small, rather broken, yet tolerably well defined. I am positive the rock crushed paid over $100 per ton. Thomas Knight & Co. have some good locations; not much work done. Tough-nut has the same character of quartz as the Mountain Booner, the ledge is situated about the same and will pay as well. There is a cluster of mines around New River City. Of the Nevada, the surface and rock on dump prospects well, the rain filled the shaft; one of the owners says it averages a foot in width. Huntington and Big Chief join; ledge 14 inches; between walls, three feet, prospects well. These three mines have every indication of being a good property. About one mile west is the Mary A., which has all the requisite qualities for a good mine. On the divide between Slide Creek and Battle Creek are the Hard Tack and Ridgeway. So far as developed they are the best two mines in the district. More work has been done on them than on any others; perhaps this is the reason they show so much better. They join, and both have shafts 80 feet down. The Hard Tack arastra is running, and a good clean-up is confidently expected. The Ridgeway has bought a mill, which will be packed in as soon as possible. Liae Oak, Live Oak Extension, Friendship, Celeena, and a host of others I don't know much about. The Friendship is a very large and well-defined ledge, though of low grade. I think it a good prospect, as most of the claims had to sink twelve or fourteen feet to get $30 rock. Very little work has been done toward developing it. Golden Gate, Occident, Orient, Argonaut and Good Enough are the principal mines on Battle Creek, and I think they are good ones. The Golden Gate is bonded for $11,000; the other four are just as good. I am of the opinion that there are only two ledges that will average $100. I suppose there is no need to say anything about the Mary Blane and Yankee Boy; as soon as weather permits their mills will be running. The Grover Cleveland is a daisy; thirty-inch ledge, well-defined; good wall. I think it will average $40 a ton.

NEW RIVER FINDS.—Yreka *Journal*, March 6: The New River mines continue to attract considerable attention, and will soon be visited by an army of prospectors. A number of very rich paying ledges have been discovered, and the great prospecting field for new ledges at that region will be in the southern part of this county. A trail is to be opened between Cecilville in the Salmon river section of this county, to New River, on which only seven or eight miles will require any work to be done, and when completed will be the shortest route to the new mines either by way of Trinity Center or from this place. A good trail leads to Cecilville from Trinity Center on the Scott valley and Redding wagon road, over which a weekly mail is now carried, and in this county a good trail is built from Etna to Yocumville and Cecilville, with trails to New River which come together before crossing the divide to New River. Chas. Baird, who is engaged extensively in the packing business, has just returned from New River by the route from Cecilville, and intends making a full load of provisions to the new mines next month, there being very little snow on the route to interfere with making good time. In addition to the labor and money advanced to fix up the trail from Cecilville, the New River miners will give a couple of hundred dollars for the same purpose, knowing it is the shortest route to secure the cheapest flour, grain, hay and farm products, as well as beef and bacon.

NEVADA.

Washoe District.

HALE AND NORCOSS.—*Enterprise*, March 7: Work is being pushed at the above mine, and the managers intend to find an ore body if there is one to be found. They have advanced No. 1 crosscut, on the 2800 level, and are now in over 50 ft in good-looking quartz. The No. 2 crosscut is also in fine quartz. On the 2900 level the north drift is in about 110 ft. No. 2 crosscut on this level is in about 55 ft and is in quartz and porphyry, having passed through about 10 ft of good ore, some of it being very rich. They expect soon to encounter the same body of ore found in No. 1 crosscut on the 2800 level, but are not in far enough yet to be under it. On the 3000 they are driving a north lateral, just skimming the ledge, and are in a fine, heavy clay formation. They will crosscut after advancing further.

OPHIR.—On the 500 level have been engaged in cutting a drain and timbering. The drift which is being run north from the west drift on this level is a joint Mexican and Union Consolidated drift.

OVERMAN.—Two shifts have been put to work in the Overman mine. The old Lambert tunnel has been cleaned out and will be driven in to strike the croppings on a level with the railroad side track.

CROWN POINT AND BELCHER.—At the Belcher and Crown Point the usual amount of low-grade ore is being extracted from the old upper levels and sent to the Carson river mills.

C. AND C. SHAFT.—Ore is being extracted from the 1200 level under the Jones contract and is shipped to the Eureka mill.

SAVAGE.—Nothing of importance is being done in the Savage, but they are waiting for the result in Norcross.

GOULD AND CURRY.—The usual work is being done, but nothing of importance has occurred during the week.

CHOLLAR.—They are running a drift in west on the 2800 level and are in good looking ground.

SIERRA NEVADA.—Work of repairing machinery, etc., is progressing favorably.

BEST AND BELCHER.—They are pushing forward the north drift on the 1000 level.

Columbus District.

MOUNT DIABLO.—Candelaria *True Fissure*, March 6: The west drift on the sixth level has advanced 10 feet during the week, and is now in 156 feet. The south cross-cut from this level is in 45 feet. The west drift on the fifth level has been driven 12 feet, and the face shows a little low-grade ore. The stope from this drift is turning out some $60 ore from a promising ledge. The west drift from the raise above this stope is in six feet and shows 18 inches of $100 ore. The intermediate, between the fourth and fifth levels near winze No. 2, is giving some $30 ore from an encouraging looking ledge. The stope between the third and fourth levels and near winze No. 3, is giving some $100 ore from a ledge now showing about a foot in width. The stope between the second and third levels and west of the shaft, is looking well and turning out the usual amount of ore. The mine, as a whole, is looking well and turning out nearly as much ore as is being crushed. A bullion shipment amounting to $10,847.73 was made on March 1st.

Eureka District.

WHAT IS BEING DONE.—Eureka *Sentinel*, March 7: While times are unprecedentedly dull with us, and while work has, to a great extent, been suspended by some of the larger companies operating here, yet the prospects in the mines close to Eureka were never more numerous, and if we believe one-half of what we are told, they were never better than at present. The Richmond mine, which has produced several millions in bullion, is closed down and no work is being done in the property at present. In the Eureka Con. some 40 men are employed, and, according to strict rumors, a body of ore has recently been encountered on the 700-foot level, which is said to be exciting a great deal of interest on the part of interested parties. The strike is reported to have been made by a tributer named Williams on Thursday last. The Lord Byron mine yields its usual quantity of good ore, and during the past week shipped to the Richmond furnaces 57½ tons. Some tributers in the Bowman shipped recently to the same furnaces for reduction 20½ tons of ore. The King Lear sent in on Thursday last three and a half tons of rich rock to the Eureka Con. furnace. On Wednesday two and a half tons were shipped to the same reduction works from the Hillside. The Phœnix, on Ruby Hill, which property is owned by a San Francisco company, shipped 13 tons of good ore to the Richmond works during the early part of the week. The Rescue also made a shipment of seven and a half tons. Owing to the melting of the snow on the mountains, the roads in places are so heavy that it is considered impracticable to haul ore from several properties that are yielding well. Altogether the mines immediately about Eureka are looking well, but owing to the fact that but few miners are working for wages, there is comparatively little coin in active circulation, and consequently a stringency is experienced by business men and others of Eureka.

THE EUREKA CON. MINE.—*Sentinel*, March 9: A reporter yesterday spoke to Supt. Robbins, of the Eureka Con. mine, concerning the rumors on the street of new and valuable developments having been made in that property recently. Mr. Robbins stated that the mine generally is looking better than it has at any time during the past year. The ore deposits on the second and third levels are yielding well, and

on the seventh and twelfth levels the deposits are unusually promising and flattering. The extent of them has not been ascertained, nor can an approximate idea of their size be learned for several days yet, and probably longer. One feature of which pleases Supt. Robbins especially, is that they are both in sections of the mine that have not been prospected much. Miners on the streets, who claim to know whereof they speak, say that the seventh level development, or the Williams' pitch, is liable to prove a bonanza of no mean proportions. The reporter noticed a cheerful air pervading the company's office, which was not inspired altogether by the bracing weather.

Silver Glance District.

GOOD REPORTS.—Virginia *Enterprise*, March 6: Good reports continue to come from the mines near Mountain House and Wellington. Willard & McDonald are running their little mill on good paying ore, and an exceedingly rich gold ledge was discovered last week in the mountains seven miles north of Wellington, near the old Carson and Aurora stage road.

Tuscarora District.

NORTH BELLE ISLE.—*Times-Review*, March 6: Drift north, on the 150-foot level, has been advanced eight feet; total length by contract, 78 feet. No material change to note.

INDEPENDENCE.—South drift, 400 foot level, has been extended 1,077 feet; progress for the week, 13 feet. Cross-cut east, same level, has been advanced four feet; total, 53 feet. Rock continues very hard.

BELLE ISLE.—North drift, from east cross-cut 400-foot level, has been advanced eight feet. The ground is considerably broken. We are preparing to stope some ground, above the 250-foot level, on the west vein.

NAVAJO.—Have started a cross-cut near the shaft on the 150-foot level, to prospect a vein encountered several years ago above this level in sinking the main shaft. Johnson's cross-cut east on this level has been advanced 14 feet. No. 3 cross-cut has been extended six feet; total length, 142 feet. Work has been resumed in the face of No. 2 cross-cut. Drift south, from No 3 cross-cut has been driven eight feet the past week—total length, 19 feet—and continues to yield some good ore. No. 2 upraise on the east vein is up 83 feet, ledge fair size. ore low-grade. No. 1 winze on the east lateral vein, 350-foot level, has been sunk 68 feet; progress 20 feet. On the 650-foot level during the past week, we have driven with the power drill 40 feet, the south drift having been advanced 16 feet, and the cross-cut east 14 feet. No material change to note.

White Pine District.

ENCOURAGING.—White Pine *News*, Feb. 28: The reports that reach us from Hamilton are of an encouraging nature as regards the mining outlook next spring. The Sweetwater Company's, and the Edgar and Ward Beecher mines are showing some promising developments.

Willow Creek District.

PRODUCING WELL.—Eureka *Sentinel*, March 6: John McGrath, assayer and superintendent of several valuable mining properties at Willow creek, is in town. From him we learn that the Wild Deer mine, owned by H. H. McColley, is looking exceedingly well. The shaft has been sunk to a depth of 165 feet, and a true fissure vein, encased in slate, and six feet wide, has recently been discovered, a two-foot streak of which near the foot-wall will average $100 a ton. Mr. Grath stated that since his arrival in town he has received intelligence of a new strike in a tunnel on the property, which is run in on the vein about 750 feet down the mountain from the shaft, of a four-foot vein of good paying ore. He says the Ohio mine which was recently purchased by a Salt Lake company, is also looking well. They are gradually increasing their force of men, and they talk of putting up concentration works at an early date. The vein of ore in their property is similar to that in the Wild Deer, but it is of a more refractory character. Mr. McGrath says that the average assay of the ore thus far extracted in his section to be worked has been over $100 a ton. It is the intention of his company to start up within a fortnight their five-stamp wet crushing mill. His principal mission to our town is to make certain tests and to ascertain the proper processes for the successful working of their ore. They have enough ore on their dumps and in sight to run the mill at its present capacity for six months. About 20 per cent of the ore of the district is gold. Along Willow creek several gold quartz claims are being worked, and they yield well. Some assays of the ore go as high as $2,000 a ton. Altogether the entire district is looking well, and recently quite a number of letters have been received by him and others there from outsiders asking for information concerning the camp. He believes the section a good one for miners and prospectors. Willow creek is on the Silver City stage road, 35 miles north of Winnemucca.

ARIZONA.

HEAD CENTER.—Tombstone *Epitaph*, March 1: Yesterday, in conversation with a late employe of the Head Center mine, it was learned that the mine would resume operations in the course of two or three weeks. It was also ascertained that the mine had closed down on account of some difficulty between the Head Center and Tranquility mining companies, regarding a stock apportionment. It will be remembered that the above companies were some time ago consolidated, after a prolonged and exciting law-suit in which thousands of dollars were spent by both sides. A compromise was effected by consolidation after a verdict had been rendered, and at this late day a dispute has arisen as to the proper apportionment of stock. When the Contention consolidated with the Flora Morrison the latter mine gave over all of its stock to the former, and received but a very few shares of the Contention. It is not known how the case stands with the Head Center and Tranquility, but it is hoped the squabble will be peaceably settled and operations resumed. Sixty or seventy men thrown out of employment at this stage of the game makes a decidedly perceptible difference all around.

CHERRY CREEK.—Prescott *Courier*, March 6: The Conger mine, Cherry Creek district, is opened by shaft a depth of 100 ft, a tunnel 283 ft and another tunnel 187 ft. It has a very long chimney of ore. The Cactus mine, in same district, is pierced by a 200 ft tunnel; there is also an 85 ft winze. Both these mines belong to capitalists who reside in Stark county, Ohio. Ore worth $4 a pound has been taken out of them. The ore is richest in gold. A 10-stamp mill, which is run by water power, operates the mill and its two concentrators. Mr. C. A. Bush is the superintendent, Mr. James Tappan foreman of the mines. Mines, mill, etc., are managed in a business way; there is no hurrah, no leaks, no idleness, The work of putting a very large dam in the Verde river and cutting a ditch necessarily costs considerable money, but both improvements are there to stay. A smaller wheel, more concentrates, rock breaker and other things will shortly be added, and we risk nothing in stating that the property is sure to pay. Mr. George H. Hammond, a most excellent miner, visited the Sterling mine a day or two ago. His opinion is that it is a good mine. Several carloads of ore will soon be shipped from silver mines on Cataract creek.

PUMPS.—*Record*, March 6: The Grand Central mine, at Tombstone, now employs 200 men. The new pump is said to be the largest ever put into a mine on the coast at the same depth and only exceeded in size by the Union pump on the Comstock.

SILVER ORES.—Nogales *Frontier*, March 6: A large amount of silver ores is shipped from Nogales to Benson and Pueblo smelters. A smelter would pay a handsome return on the investment if established here.

MINING IN MOHAVE.—*Miner*, March 6: In the Twin gulch near Cerbat, Mr. Jones has an arastra running on ore from the Eureka and Vanderbilt mines. We hope he will make a success of it. On the Tigress mine at Stockton Hill, Messrs. R. Gray, Reilly & Mechan have been at work for some time, getting out a carload of ore for shipment. The work was completed yesterday, and the first load has already left for Kingman. This is one of the oldest claims on the hill, and has produced a large amount of very rich ore in years past. We are pleased to note that preparations are now being made to open up this mine in a systematic manner, by running a tunnel under the old workings. A road will also be built from the dump to intersect the Kingman road, and thus avoid the expense of packing. John Kennedy has two men at work on the Little Chief, one of the best known high grade mines in Wallapai district. He has about 5 tons of ore on the dump, about 2 tons of which be calls first-class ore, and which may be depended on to mill in the neighborhood of $700 to the ton, while the other three will reach $300 to the ton. The Little Chief has already produced about $50,000, and seems to be keeping up its reputation as a bullion producer. At the I. X. L. mine, the Burke Bros. are taking out a fine grade of ore and lots of it. We are told that recent work has exposed to view a splendid body of ore in this claim. We hope so, for the boys are good workers and deserve to strike it rich. On the Star Spangled Banner, at Stockton, Hon. David Southwick has three men at work, taking out a fine grade of galena ore. Wm. Engle, one of the pioneers of Wallapai and Cedar districts, is putting in his time on the Bullion mine. Frank Sage and Joe Bolan are working on the Moonbeam mine, at Stockton Hill, and taking out $400 ore. It is estimated by experienced miners that there is from $15,000 to $20,000 worth of ore in sight in this mine. The force of men will probably be largely increased as soon as Mr. Gale, the fortunate owner, returns from New Orleans. Isaac Conkey is taking out a fine grade of galena ore at the "Old Standby," on the divide between Stockton and Cerbat. The last carload shipped from this claim assayed 33 ounces in silver and 58 per cent lead. Wynn Sherman has just finished packing 12 tons of ore from the Golconda mine to Cerbat, and Musser's teams are employed in carrying it to Kingman. Mr. Sherman informs us that the bulk of this ore will assay 50 ounces in silver and 60 per cent lead, while some of it will go much higher in silver. Kimble Bros., of Signal, have four men at work on the Signal mine on the McCracken lode, who are taking out considerable ore. The Burro Mining Comoany shut down their mill a few days ago, but still have quite a force of men at work on the mine, which is undoubtedly a valuable piece of property. Mr. James Music a thorough practical miner, is superintending the mining operations of this company. Messrs. Asbury and Lockhart are working the Mocking Bird mine on a lease. The mine was in bad shape when they took hold of it a few weeks since, and considerable dead work had to be done before the work of taking out ore could commence. We are pleased to state that they have struck good paying ore during the last week, a sample of which assayed 110 ounces silver.

SNOW.—Prescott *Courier*: There is an undeniable dearth of mining news in this section at present, though the prospect of more lively times in the near future is quite encouraging. The snow in the Hassayampa and Bradshaw mountains is a serious obstacle in the districts south of Prescott. Last week, while it tained hear it showed in the mountains. Fred Sattes, who came in from Crook canyon, says 10 inches fell on the Maple gulch divide, and the Prescott and Bradshaw road is not passable for wagons beyond the Hassayampa bridge, and will not be for several weeks to come, as it is certain to snow more in March. Wagons can get in to Turkey creek, Pine flat and the Peck districts by going the old road by Big Bug, east of the range, but the road is sadly out of repair. Out in that section, John Holmes, Mulvenon & Roach, the Pine Spring Co., and others in the Peck and Tiger districts, are taking out good shipping ores, but will not attempt to move any of it till the roads are in good condition. West of Prescott, on the A. B. mine, the leasers are in 225 ft with the tunnel, and last week have had a streak of black sulphide and native silver ore, from 2 to 4 inches thick, assaying over 400 ounces per ton.

GOLD ORE.—Messrs. Olden & Nicols, from Upper Verde, report that the Conger mill has been treating the gold ores of that section with good success, which will stir up business in Cherry Creek and Black Hills districts, as the mill proposes to work custom ores at reasonable rates. Mr. Olden is preparing to send 100 tons of gold ore to the mill, and also to ship a quantity of silver ore to Pueblo, Colo. Governor Tritle has two experts examining the various mining claims on Big Bug, Lynx creek, Hassayampa and other sections which might be tributary to the Howell works, in Walker district with a view to starting up the works in the spring. The placer miners in all directions are getting out gold from the old diggings which have been worked each spring for the last 20 years, and occasionally we hear of a little strike of something like old times, but the average pay is small. Want of water to work the high bars is the trouble with placer miners. Several parties have recently been making inquiries for gold-bearing quartz veins, and a large property of that description could doubtless be sold at good figures. The recent slight advances in the prices of galena and copper has produced a better feeling among the owners of such properties, who hope to be able to resume operations in the spring.

COLORADO.

NOTES.—Georgetown *Courier*, March 5: Hood & Co. have a large body of low-grade ore in the upper workings of the Griffith. The Centennial's output last week was nearly 17 tons. The ore is increasing in value. The lessees on the Niwot lode, Leavenworth mountain, are reported to be taking out some good ore. A prominent Democrat mountain mine will soon be started up with a large force of men on day's pay. The Terrible mill will be repaired and the machinery put in condition for a resumption of work by the 15th. The two ore houses at the Colorado Central mine are full of ore, and sacked ore is found stored away in scores of places, throughout the mine. Seven men are employed at sorting. The miners on the Owasco and Atlantic lodes, on Brown mountain have been experiencing much trouble with the snow, which lies to the depth of nearly 4 ft. The lessees on the former have found it impossible to ship any ore since December. The Atlantic boys managed to bring some ore down last week by sliding it over the frozen surface of the snow in gunny sacks. The Swamp Angel is in good running order again, the shaft and levels having been cleaned out. Messrs. Rockwell & Co. deserve considerable praise for the perseverance they have shown. During the last five months they have been constantly expending money and have put in a new pump and accomplished other improvements.

THE BALTIMORE.—This property never looked better. Ore is shown in all the workings. It has been paying during a number of months past a dividend of about $2,500 per month, besides during a large amount of development. Mr. John Fillius, the superintendent, hopes to increase this dividend to over $4,000 per month or about $50,000 during 1885. The mine is being systematically developed and new ground is being opened up. As fast as ore is worked out in one portion new bodies of ore are opened and ready to take out in other portions. The average value of the ore is over $300 to the ton.

THE COLORADO CENTRAL MINE.—A trip through the labyrinth of levels, shafts, cross-cuts and tunnels of the Colorado Central mine, readily convinces one that it is one of the most stupendous enterprises in the State. There are nearly 6 miles of these openings on the property, which cost an immense sum of money, but the wealth it has produced will run up into the millions. Through nearly all these openings can be traced veins of ore, sometimes pinched to a knife blade seam, and then opening into a 2-ft vein. The work for a number of years past has been confined to development, and now there are over 25,000 fathoms of ground opened, ready for stoping, in every fathom of which there is big pay, and which would take the present force two years to work out. Besides, there are thousands of fathoms ready for stoping, in which there is every probability of finding large and rich ore bodies. Nearly all the ore exposed in the workings is of a high grade, much of it, when closely sorted, mill over a thousand dollars to the ton. It is surprising to the uninitiated to learn that the small veins of ore net a neat profit for all the rock that has to be taken out while drifting. But the grandest sight in the mine is to see veins of ore, from 12 to 18 inches thick, of nearly solid mineral, through which is interspersed ruby silver ore, polybasite, and gray copper. Such bodies represent immense wealth. It is the intention of Mr. Hall, the superintendent, to keep up the present system of development, and increase the force workmen according to the means of handling the ore and debris economically. In this connection we might mention that the system inaugurated by Mr. Hall for handling rock is not surpassed in any of the mines. Everything is arranged to avoid, as far as possible, the slow and laborious process of using a shovel.

IDAHO.

SALMON NOTES.—Cor. Idaho *Messenger*, March 3: John Gilmer of the Kentuck mine of Mineral Hill, passed through on his way to Salt Lake. He took down the first cleanup from the new mill. Something over 40 pounds of gold for a short month's run—a decidedly paying investment for the Kentuck company. Harrison & Rolston recently opened a fine body on their new location. Our friend, Mark Ainslie, has exceeded his fondest hopes this winter in Pine creek. Another mill will soon awaken its echo in that place. Among other discoveries, there has been found a fine vein of coal, close to Salmon, of the best character—bituminous. We will soon have coal to ship out instead of in. From all indications and the results of tests made, we will not want for material for a boom next summer. There is, a short distance from here—in quantity—a metal that has long been sought after but not found because our prospectors did not know its appearance. As black sulphurets in the early days of the Comstock, was cursed and cast aside as worthless because it interfered with the quicksilver in gathering the gold they were after and its value not known; so the miners of Lemhi have cursed the metal that has the same apparent specific gravity of gold and which has annoyed them. It is, beyond a doubt, tin. Tin ore in granite, in slate, in porphyry, in synite, and in greenstone. It is in the same formation, same country rock, as they recently found it in the Black Hills, and with tin—in quantity—added to our precious metals none can gainsay the assertion, that we live in one of the richest mineral regions of the world.

CŒUR D'ALENE.—*Sun*, March 6: Six hydraulics will be turned loose in less than two weeks on East Eagle. Prichard creek was booming yesterday, and the water was as clear as crystal. New mining locations are made in every direction, and when the snow disappears there will be a lively conflict of titles. Work was commenced yesterday on the Nugget fraction, at the mouth of Dream gulch, the next claim below the celebrated Webfoot. A miner from the head of East Eork of Eagle creek brought to the bank of Murray on Saturday, the washings of a single pan of dirt, which, on being weighed, reached the value of $3.60. His statement was that it came from a prospect hole on a tributary to Eagle creek. The sight of 14 ounces of dust in one pile so early in the season is a good eye-opener, and illustrates what Prichard creek is capable of doing the coming summer. The gold was brought to the bank of Murray on Sunday morning by the Frank Grove Company and came from the Frank Grove claim, a mile west of Murray. It was not sluiced out in the regular way, but was the result of prospecting with a pan during several days of the week. The Webfoot claim on Dream gulch made its first cleanup for the present season on Sunday, and the returns show a a little over two ounces of very fine gold. This result was obtained from the tailings of last year's washings, which were run through the sluices to get them out of the way of the drain ditch being run for active operations with hydraulics next month, if the weather does not interfere. The cleanup shows that there is a mass of fine gold in Dream which passed through the sluices last season, but will be provided for during the present one.

NEW MEXICO.

BONDED.—Silver City *Enterprise*, March 6: The Silver King mine, at Bald Mountain, recently bonded by Lewis, Colquhoun and Rich is looking remarkably well, we are informed by Lewis who came in this week. Work is progressing steadily upon it. The following ore shipments were made from Whitewater since February 15: McGregor Bros., Georgetown, three carloads of concentrates to Socorro smelter; Benson smelter company, nine cars of iron from their iron mine at Santa Rita to smelter at Benson; Smith, Tower & Co., Georgetown, one car of high-grade ore to Socorro. Nick Rascom, one of the most tenacious and progressive of prospectors, has been developing a group of claims at the head of Gold gulch in the Burros since the first of January, and reports having struck mineral that looks well, but which as yet he has not assayed. Mr. Rascom has bonded his claim at Malone to some Cal. people whom Murat Masterson of Deming represents. The Rose mine over which there has been so much dispute has finally passed into the hands of parties who will speedily commence development. The Silver Bar No. 1, the property of the Peacock mining company is showing some immensely large and rich bodies of ore under the present efficient management. Machinery will also be erected in the near future to treat the ores of this promising property. The Silver Bar No. 2, of which Joe E. Sheridan is superintendent, has suspended development work until officers and directors arrive from St. Louis. The property shows some fine mineral, probably enough to justify the St. Louis parties that own it in erecting a mill to treat its product. Silver Bar No. 3, the property of H. J. Hutchinson of Central City, gives promise of rivaling the above mentioned mines, as during the progess of assessment work a large body of high-grade ore was encountered that for extent or richness is not surpassed by any claim in the district.

MOGOLLON DISTRICT.—Capt. M. Cooney of the Mogollons, principal owner of the famous Cooney mine, 80 miles from here, visited Silver City during the week and reports everything pertaining to mining at Cooney as assuming a bright and prosperous outlook. Mr. Cooney has demonstrated since assuming personal management of his property that the marvelously rich and large veins of ore of his section when practically and economically worked even at the great disadvantages under which the mine owners have to contend can be made to pay handsomely. The property had run behind many thousand dollars under former management, but now we are pleased to state is paying its owners handsome dividends besides keeping up extensive exploiting expenses. Between three and four carloads of high-grade ore and concentrates are monthly shipped from this property; work has for the present been discontinued on the 750-foot level, pending the completion of an upraise of 70 feet which has been contracted for. This level is now 640 feet in length, and the last 70 feet has been run along on ore body which at several different points shows an average width of seven feet. Tests show this ore runs one and one-fourth ounces in gold and 20 ounces in silver. This vein is supposed to be the lower end of an immense ore shoot that crops out on the surface to a hight of 35 feet, and is 255 feet in length by about 24 feet wide. As soon as this upraise is completed the level will be continued 100 feet further under the mountain to ascertain the character and value of the ore, which shows from the above test at the present point to be of a very satisfactory richness. In the mean time another shaft is being sunk 50 feet north that will at a depth of 50 feet be drifted upon to determine the quality of ore at this particular point. When these developments are completed we are assured by Capt. Cooney that a complete reduction plant of a large capacity will be erected and the little mill in operation removed from its present location three milles farther up the gulch upon the mine. Pending the present extensive developments the mill draws its supply of ore from a large stope contiguous to the old main shaft. The mine throughout is looking well and many tons of ore await the erection of works of sufficient capacity to treat it.

OREGON.

WATER NEEDED.—Jacksonville *Times*, March 6: Water is running down fast and more rain is needed at once. Nail & Casteel, of Josephine county, have been on Applegate looking at some mines, and may conclude to work them. Frank Ennis, superintendent of the Sterling mines, informs us that his supply of water is getting light, which is generally the case. R. Cook, who returned from Steamboat this week, informs us that his tunnel is now 342 feet long and 180 feet deeper than where quartz was struck before. A company of our French citizens, known as Joe, Jerry and Jerome, who are mining on Kanaka flat, recently picked up two pieces of gold, which are worth $25 and $8 respectively. M. F. Hull, of Foots creek, who is in town, informs us that the miners of that section have done well so far this season. He says that Huston & Anderson picked up a piece of gold worth $18 not long since. Considerable mining is being done in the Steamboat district, with favorable results. Prickett & Finney recently picked up a nugget weighing nearly $30. Meldrum & Co. and Sargeat Bros. are mining on Brush creek and are doing well. G. B. Caldwell & Son have their hydraulic pipe at work, and are washing off a large amount of dirt, while Duncan & Caldwell are also busily at work.

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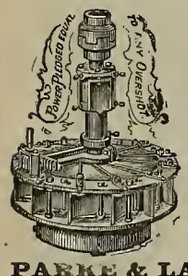

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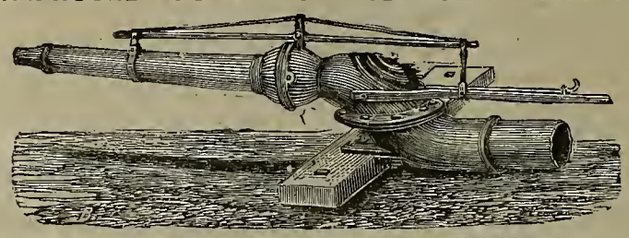

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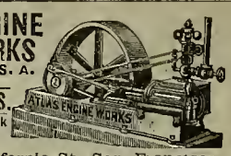

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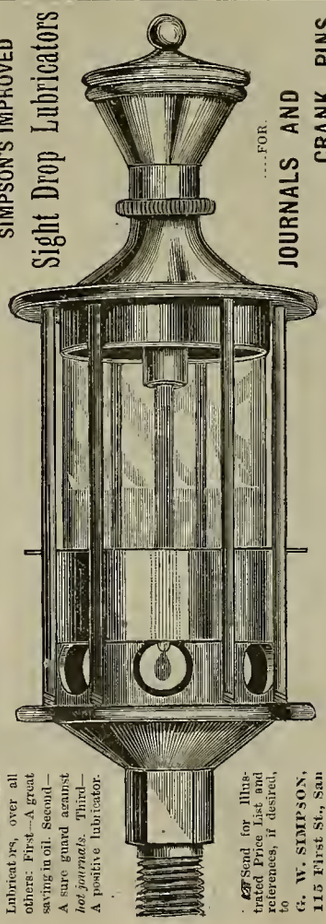

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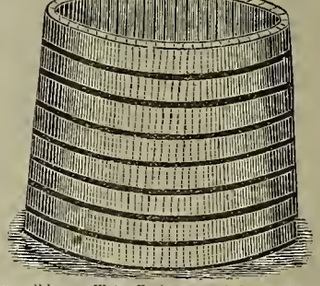

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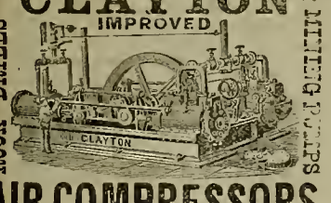

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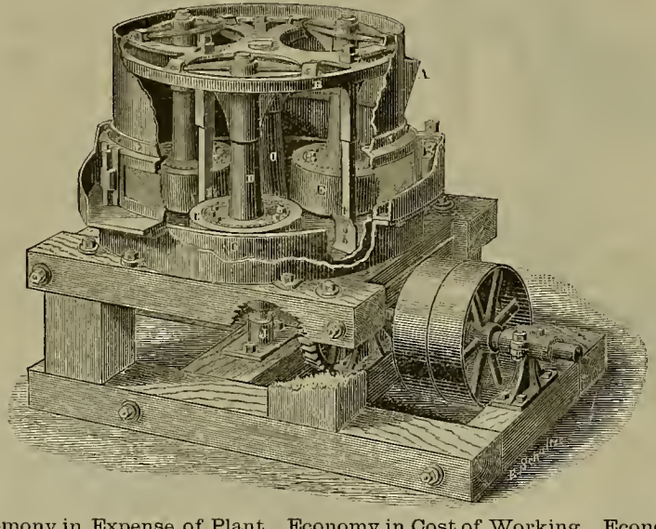

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Calico District.

(Continued from page 173.)

Considerable development has been made. Owing to the high location and the abrupt raising of the walls of the canyon on the side of which the mine lies, the getting of ores to the wagon road is slow and difficult as well as very expensive. Tramways nearly 300 feet long, about 100 feet of which is nearly perpendicular, are used, and "Go-Devils" carry ores in sacks down the giddy hights to waiting teams in the canyon below. No machinery but a hand windlass is used. The scarcity of wood and water makes the use of the labor-saving steam engine, a costly and uncertain piece of property. The development on the Sue is not as extensive as that of the Silver King. But little depth has been made, although considerable good pay ore has been taken out. The formations are very much like those of the Calico mines. There is about five hundred feet of development on the Sue.

North End Mines.

Directly north of the Sue, on the south slope of a mound like mountain, is the Martha, owned by Dr. Julius Koebig, of Daggett. The doctor, it is said, is about to erect reduction works at Daggett. The Martha is not developed much as yet. The Lone Star group, owned by Messrs. A. G. Rhodes, Thomas Tait and H. E. Evans of Calico, is an excellent property, and although no great amount of development is done as yet, rich vein matter and high grade ores have been taken out. Eight men are at work on this Lone Star group. The ore is hauled to Waterman's mill, some fourteen miles distance. North of these mines but little development has been made on any claims.

East Calico.

The Garfield, Raymond group, the Snow Bird and a host of other mines, constitute the south end of the district. The formations are similar to the balance of the district, only not so rugged or numerous. The rich paying matter is sorted and sacked for shipment, and in the Snow Bird mill averages $75 per ton. These ores are found from grass roots down, and are virtually quarried out of the side-hills. A large number of chloriders are at work in East Calico. South of these mines the entire hills are taken up for horax claims, many of which are already yielding a large output. Barber's custom stamp-mill about one and a half miles distance, is putting in five new stamps, and when ready to start, will add much to the district's output.

Other Districts.

The Lava Bed southwest of Daggett is at present almost deserted. Work will be resumed early in the fall. Waterman, fourteen miles west of Calico, is working a good force of men, taking out ore, and in addition to treating his own, crushes for others. The Daggett mines and mill, southeast of Calico, is also adding to the country's ore and bullion output.

The Silver King Mill.

One mile north of Daggett station, on the bank of the Mojave, is the Oro Grande mill, now owned by the Silver King mine. G. Bahten has charge of the mill. The building is about 150x80. The process is the Boss continuous. Fifteen stamps, two grinding, six amalgamating, and four settling tubs constitute the process. After being fed into the rock breaker, the ore travels the rest of the way to the slickens dump by a series of self-feeding arrangements that work with a certainty and regularity that is admirable. Steam power oil is used for fuel, 13 barrels per day being required. About 75 tons of salt per month is used. The monthly shipments of bullion run from $40,000 to $50,000. Over $1,000,000 has been shipped by this mill since the King people bought the mill.

The Town of Calico.

Seven miles north of Daggett is the much-talked of city of Calico. One narrow and serpentine street is the only thoroughfare. The place is built ou a narrow ridge; the back end of lots on each side of the street end on or over a bluff. Small, hastily-built houses are the order of buildings, only a few two-story houses gracing the camp. Saloons are more than numerous. Business generally is overdone, and the number of black-legs and tin-horn gamblers that infest the place is remarked by the newcomer. The only water supply is that hauled two miles from Evaus' well, and costs from 3 to 5 cents per gallou. Wood is $10 per cord. Board, $7 and $8 a week. The Occidental and Whittield House are the only hotels, and they are pushed to their utmost capacity to accommodate the travel that is arriving daily. The camp is a good one, but at present is overestimated and overcrowded by men out of money and work. Capital, development and a chance is all that this camp needs to be a second editiou to the Comstock at no great distant date.

F. W. S.

Bullion Shipments.

Alhambra Mill, March 8, $12,870; King, 8, $11,127; Richmond, 2, $18,293; Crescent, 5, $4,000, Germania, 5, $4,099; Stormont, 6, $3,100; Germania, 6, $3,955; Christy, 6, $3,600; Wood River ore, 8, $1,288. At Salt Lake the base metal and ore output for the week ending the 8th amounted to 18 cars of bullion and 16 cars ore. The weight of the bullion was 412,258 pounds, and the ore 438,930 pounds.

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Alpha Con M Co	Nevada	19	50	Jan 20	Feb 26	Mar 21	W Willis	309 Montgomery st
Belmont M Co	Nevada	39	15	Feb 11	Mar 21	Apr 13	J W Pew	310 Pine st
Black Bear M Co	California	2	25	Dec 20	Feb 20	Mar 17	W L Oliver	328 Montgomery st
Bulwer Con M Co	California	1	20	Jan 13	Feb 24	Mar 31	W Willis	309 Montgomery st
Butte Creek H M Co	California	11	10	Jan 30	Mar 9	Mar 31	R L Taylor	230 Montgomery st
Cueva Santa M Co	Mexico	5	25	Jan 22	Feb 27	Mar 29	W L Oliver	328 Montgomery st
Champion G M Co	California	18	10	Jan 28	Mar 6	Mar 28	T Wetzel	522 Montgomery st
Caledonia M Co	Dakota	15	15	Jan 27	Mar 9	Apr 6	W L Oliver	328 Montgomery st
Con Virginia and California	Nevada	2	20	Jan 15	Feb 20	Mar 21	A W Havens	309 Montgomery st
Eintracht Gravel M Co	California	17	05	Dec 9	Mar 3	Mar 21	H Kuntz	209 Sansome st
Exchequer M Co	Nevada	21	20	Jan 2	Mar 3	Mar 23	C C Elliott	309 Montgomery st
Golconda M Co	California	1	03	Feb 7	Mar 12	Mar 31	J M Buffington	309 California st
Golden Channel M Co	California	2	01	Feb 12	Mar 26	Apr 21	A B Paul	328 Montgomery st
Hazard G M Co	California	6	05	Jan 21	Feb 23	Mar 28	J T McGeoghegan	318 Pine st
Homeward Bound Pl M Co	California	3	15	Feb 21	Mar 12	Apr 6	D A Smith	209 Post st
Indian Spring Drift M Co	California	5	03	Feb 19	Mar 23	Apr 23	A B Paul	328 Montgomery st
Independence M Co	Nevada	14	13	Jan 21	Mar 2	Mar 30	J W Pew	310 Pine st
Martin White M Co	Nevada	19	25	Jan 15	Feb 25	Mar 25	J Scoville	309 Montgomery st
Mayflower Gravel M Co	California	28	10	Jan 20	Feb 27	Mar 20	J Morizio	328 Montgomery st
Mexican M Co	Nevada	29	25	Feb 24	Mar 31	Apr 21	C E Elliott	309 Montg mery st
North Star G M Co	California	1	1.50	Mar 5	Apr 9	May 1	D A Jennings	401 California st
North Banner Tunnel Co	California	6	4c	Feb 7	Mar 13	Apr 7	T J Mitchell	Grass Valley
Ophir M Co	Nevada	49	50	Feb 18	Mar 24	Apr 13	E B Holmes	309 Montgomery st
Peer M Co	Arizona	2	50	Jan 14	Feb 19	Mar 16	A Waterman	309 Montgomery st
Peerless M Co	Arizona	3	50	Jan 14	Feb 18	Mar 14	A Waterman	309 Montgomery st
Potosi M Co	Nevada	17	25	Jan 27	Mar 2	Mar 24	C L McCoy	309 Montgomery st
Rocky Bar M Co	California	8	25	Feb 18	Mar 24	Apr 13	G W Hill	Grass Valley
Sulphur Bank Q M Co	California	3	50	Feb 25	Apr 16	Jun 1	L Hermann	220 Sansome st
Savage M Co	Nevada	62	50	Feb 2	Mar 6	Mar 26	E B Holmes	309 Montgomery st
Sierra Nevada M Co	Nevada	81	25	Feb 18	Mar 25	Apr 14	E S Parker	309 Montgomery st
Union Con M Co	Nevada	29	25	Feb 16	Mar 24	Apr 14	J M Buffington	309 California st
Yosemite M Co	California	2	2½	Feb 7	Mar 16	Apr 21	J Weisheim	Grass Valley

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Chollar M Co	Nevada	C L McCoy	309 Montgomery st	Annual	Mar 18
Homeward Bound Pl M Co	California	D A Smith	209 Post st	Annual	Mar 16
Jackson M Co	California	D C Bates	309 Montgomery st	Annual	Mar 23
Marshall M Co		A D Perkins	310 Pine st	Annual	Mar 26
Meloneas Con M Co	California	E M Hall	327 Pine st	Annual	Mar 24
Sierra Nevada M Co	Nevada	J L Fields	330 Pine st	Annual	Mar 17
Virginia Con M Co	Nevada	A F Bernard	864 Howard st	Annual	Mar 19
Ward G M Co	California	E M Hall	327 Pine st	Annual	Mar 16

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	B L Burling	328 Montgomery st	50	Dec 5
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Dec 15
Durbec Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Oct 8
Jackson M Co	California	D C Bates	309 Montgomery st	10	Dec 27
Kossuth M Co	Nevada	C K Startevant	328 Montgomery st	06	Mar 16
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Feb 13
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Nov 28
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Feb 18
Syndicate M Co	California	J Stadfeldt	419 California st	10	Nov 8

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE Mar 5-Mar 11	Portland. Rain.	Temp.	Wind.	Weather.	Red Bluff. Rain.	Temp.	Wind.	Weather.	Sacramento. Rain.	Temp.	Wind.	Weather.	S. Francisco. Rain.	Temp.	Wind.	Weather.	Los Angeles. Rain.	Temp.	Wind.	Weather.	San Diego. Rain.	Temp.	Wind.	Weather.
Thursday	.02	56	S W	Cy.	.00	69	N	Cl.	.00	66	N	Cl.	.00	66	N	Cy.	00	81	E	Cl.	—	—	—	—
Friday	.00	49	N W	Cl.	.00	73	N	Cl.	.00	65	N W	Cl.	.00	68	N E	Cl.	.00	80	N E	Cl.	.00	77	W	Fr.
Saturday	.00	62	N E	Cl.	.00	76	N W	Cl.	.00	66	N	Cl.	.00	70	N E	Cl	.00	82	E	Fr.	.00	79	N W	Cy.
Sunday	.00	65	E	Cl.	.00	70	E	Fr.	.00	65	S E	Cl.	.00	58	W	Cy.	00	83	S W	Cl.	.00	74	N W	Fr.
Monday	.39	60	S	Cy.	.00	66	E	Fr.	.00	67	S W	Fr.	.—	59	S W	Fr.	.00	72	W	Cl.	.00	68	W	Fr.
Tuesday	.20	59	S	Cy.	.06	63	S	Cy.	.00	66	S W	Fr.	.—	61	S W	Cy.	.00	65	S E	Cl.	.00	66	S	Cl.
Wednesday	.23	57	S	Cy.	.00	64	N	Cl.	.00	60	N W	Cl.	.—	60	W	Cl	.00	68	W	Fr.	.00	66	S W	Cl.
Totals	.54				.00				.00				.—				.00				.00			

EXPLANATION.—Cl. for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature and wind and weather at 12:00 M. (Pacific Standard time), with amount of rainfall in the preceding 24 hours.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Feb. 19.		WEEK ENDING Feb. 26.		WEEK ENDING Mar. 5.		WEEK ENDING Mar. 12.	
Alpha	....	.20	.60	.65	.60	.75	....	.70
Alta	.30	.40	.25	.45	.25	.30	....	.30
Andes	....	....	....	.10	.11	.25	.10	.15
Argenta	....	....	....	....	....	....	....	....
Belcher	....	....	....	.70	....	.70	....	.70
Belding	....	....	....	....	....	....	....	....
Best & Belcher	.70	.75	.50	.90	.50	1.25	1.05	1.20
Bullion	....	.25	....	.25	....	.25	....	....
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	....	....	....	....	.20	....	.20
Bodie Con	1.95	2.05	2.00	2.10	2.15	2.65	2.25	2.45
Benton	.05	.10	....	.10	.05	.10	.05	.10
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.05	.30	.25	.30	.25	.35	....	.35
California	.10	.30	.25	.30	.25	.60	.40	.90
Challenge	....	....	....	.15	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Chollar	2.60	3.00	2.50	2.80	2.05	2.80	1.90	2.35
Confidence	....	....	....	....	....	.75	....	.80
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.10	.30	.25	.30	.25	.80	.40	.90
Con. Pacific	.70	.85	.90	.85	....	.95	....	1.00
Crown Point	....	.85	.75	.80	.80	1.05	.70	.80
Day	....	....	....	....	....	....	....	....
Eureka Con	....	2.75	....	....	....	....	....	....
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	....	....	....	....	.20	.25	....	.25
Grand Prize	....	....	....	....	....	....	.35	.40
Gould & Curry	.60	.65	.50	.75	.50	1.00	.80	.95
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	3.85	4.35	3.70	5.50	3.85	5.30	4.95	6.00
Holmes	4.50	4.60	....	4.60	....	4.60	4.80	5.00
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	....	....	....	.15	....	....	....	....
Martin White	.15	.45	....	.45	.50	1.35	....	....
Mono	1.25	1.35	1.35	1.50	1.35	1.55	1.35	1.45
Mexican	.25	.30	....	.20	.20	.40	.35	.40
Mt. Diablo	....	....	....	....	....	....	....	3.70
Northern Belle	....	....	....	....	....	....	....	....
Navajo	1.00	1.40	....	1.05	1.05	1.20	1.00	1.10
North Belle Isle	....	.15	....	.15	....	.20	....	.20
Occidental	....	.85	....	.85	....	1.00	.90	1.00
Ophir	....	.30	.10	.15	.20	.80	.20	.25
Overman	....	.20	....	.15	.20	.80	....	.15
Potosi	.75	.90	.75	.80	.75	1.05	.85	1.60
Pinal Con	....	....	....	....	....	....	....	....
Savage	.90	1.00	.90	1.00	.95	1.50	1.20	2.05
Seg. Belcher	....	1.25	....	....	....	....	....	....
Sierra Nevada	....	.30	.15	.30	.20	.40	.35	.40
Silver Hill	....	.10	....	....	....	....	....	....
Silver King	....	....	....	....	....	....	....	4.50
Scorpion	....	.10	....	.10	....	.10	....	.10
Syndicate	....	.40	.35	.40	.45	.50	.45	.50
Tioga	....	....	....	....	....	....	....	....
Union Con	.25	.35	.20	.30	.25	.40	.30	.3
Utah	.45	.55	.40	.45	.40	1.00	....	....
Yellow Jacket	1.20	1.25	1.20	1.30	1.20	1.30	....	1.3
	....	....	....	....	....	....	....	....

Lost Papers.

If any subscriber fails to receive this paper promptly, after making due inquiries at the Postoffice, he is urgently requested to notify this office by *letter*, that we may send the missing papers, and, if possible, guard against further irregularities.

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Mar. 12.

70 Alta	25c
350 Andes	10c
210 Bodie Con	2.30
250 Best & Belcher	1.10
100 Bullion	20c
535 Chollar	1.95
50 Crown Point	80c
50 Con. Pacific	1.00
250 Gould & Curry	.80@85c
1450 Hale & Nor	.5.50@5.75
300 Justice	15c
200 Mono	1.35
250 Mexican	.30@35c
200 Ophir	20c
100 Potosi	90c
200 Sierra Nevada	40c
1520 Savage	1.85@1.90
50 Syndicate	59c
200 Union	30c

AFTERNOON SESSION.

50 Alta	30c
320 Andes	15c
165 B. & Belcher	1.10
100 Bodie	2.40
450 Chollar	2.15
701 Con Va & Cal	40c
50 Grand Prize	40c
400 Gould & Curry	.80@85c
550 Hale & Nor	4.85
80 Mexican	35c
300 Navajo	1.10
200 N. Belle Isle	20c
100 Ophir	25c
100 Potosi	1.00
200 Sierra Nevada	.35@40c
140 Savage	1.20@1.25
70 Syndicate	50c
50 Union Con	20c

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Mar. 12, 1885.

ANTIMONY—Per pound		@	—
Hallet's		12½@	—
Cookson's		13 @	—
BORAX—Refined		7 @	8
IRON—Glengarnock ton		23 50 @	—
Eglinton, ton		22 50 @	—
American Soft, ton		27 00 @	—
Oregon Pig, ton		— @	—
Clipper Gap, Nos. 1 to 4		25 00 @	30 00
Clay Lane White		26 00 @	—
Shotts, No. 1		26 00 @	—
STEEL—English, lb		16 @	25
Black Diamond, ordinary sizes		13 @	—
Plow		6 @	8
Machinery		10 @	12
Sanderso 1 Bros		13 @	—
COPPER—			
Braziers' sizes		— @	25
Fire-box sheets		28 @	—
Bolt		22 @	—
Yellow Metal		14 @	15
LEAD—Pig		3¼@	3½
Bar		5 @	—
Pipe		7 @	—
Sheet		8 @	—
Shot, discount 10% on 500 bag	Drop, ⅜ bag.	1 85 @	—
Buck, ⅜ bag		2 05 @	—
Chilled, do		2 25 @	—
TINPLATE—Oldcastle		5 75 @	6 00
Charcoal		5 75 @	6 75
Coke		5 25 @	6 50
Roofing		6 25 @	13 50
ZINC—German		9 @	10
Sheet, 7x3 ft, 7 to 10 lb, less the cask		9 @	10
QUICKSILVER—By the flask		33 50	—
Flasks, new		1 05 @	—
Flasks, old		85 @	—
NEW YORK PRICES—			
California Borax, refined		8 @	8½
Pig Iron, American No. 1		17 50 @	18 50
Quicksilver		63½@	—
Lead		3 60 @	3 70
Copper		11½@	11¾
Tin		17½@	—
Bar Silver		1 06½@	—

PANORAMA visitors should be provided with Muller's Opera Glasses. 135 Montgomery St., near Bush.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, department 10, San Francisco:

MEXICAN DEVELOPMENT CO., March 11th; object: Introducing the electric light and electric motive power system throughout Mexico. Directors—J. Carlos Mexia, William M. Willey, Henry P. Burnham, R. B. Cunningham, Ricardo di Emparian, C. B. Stone, Thomas W. Temple. Capital, $290,000.

TULARE LAKE, LAND AND DITCH CO., March 11; object is blilding ditches for the purpose of conveying water from Tulare Lake and Kings river to the tillable lands of Tulare, Fresno and Merced counties. Capital stock, $500,000. Directors—Lansing Haight, William Strader, W. B. Douglas, B. J. Jenkins and David Moore.

Mining Share Market.

What interest there is in the stock market is centered on Hale & Norcross. The middle mines are the only interesting features in the market. Nearly all the fluctuations occur in them, and they are absorbing nearly all the attention of our brokers and speculators. The other stocks are dull and flat.

Hereafter the San Francisco Stock Exchange will throw its doors open to the public free at all times, except during regular sessions, and allow trading on the floor, providing the name of a member is given to bind transactions.

The *Post* states that a leading operator recently filled a line of shorts in Best & Belcher, Gould & Curry and the north end stocks, most of which he has had out for six years. Some of the stocks were put out at $6o per share, and filled for less than $1 per share.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SIGHT-PROTECTOR FOR FIRE ARMS.—John C. Kelton, S. F. No. 313,212. March 3, 1885. This is a cover for the front sights of rifles and carbines which serves to protect the sight from injury when the arm is not in use, and to shade the sight and assist in properly leveling the arm when aiming.

VALVE FOR WATER CLOSETS.—Wm. H. Gants assignee of one half to George E. Herrick, S. F. No. 313,314. Dated March 3, 1885. This is a new valve for admitting and checking a flow of water to a water closet, or other device or receptacle. It is especially useful in those places where the valve is dependent for its operation upon a float.

HARROWS.—C. W. McKelvey, Los Angeles. No. 313,357. Dated March 3, 1885. This invention relates to that class of harrows in which the teeth are adapted to rotate or revolve in a vertical plane, to clean or clear themselves. The invention consists in the peculiar construction and combination of devices, so as to provide a simple and effectual self-cleaning harrow.

FRICTION CLUTCH.—Geo. W. Bonds, assignee to Byron Jackson, S. F., No. 313,284. Dated March 3d, 1885. This friction clutch is for hoisting-drums, pulley-shafts, couplings, etc., and is now especially applicable to what are known as "wagon-derricks," in which winding drums are employed for operating derrick forks. It consists in a means for applying the clutching device so that the strain is applied without any pressure on the journals, and in certain details of construction.

REEFING UPPER TOPSAILS.—Robt. M. Belfrage, Cannonsville, N. Y., No. 313,279. Dated March 3, 1885. This is an improvement on the method of reefing upper topsails of vessels, by which the operation may be performed from the deck. The invention consists in the novel arrangement of the upper topsail reef-tackles, whereby the sail is adapted to be reefed to the lower topsail yard instead of to the upper one; in the arrangement of spilling-lines to spill or smother the sails, and in a false foot or ridge across the sail just above its foot whereby when the sail is reefed the false foot strengthens it.

IRONING TABLE.—Wm. H. Bell, Cloverdale, Sonoma Co. No. 313,280. Dated March 3, 1885. This adjustable ironing board consists of a board having toothed racks cut in the lower side, a pair of pivoted legs connected with one end of the board by a rod and open hooks, so that it may be detached, the upper ends of the legs being adjustable to the racks to raise or lower the table, and in connection with elastic straps, one of which extends from the center of the table to the center bar of the legs, while the other extends from the same attachment upon the table to the unattached upper ends of the legs.

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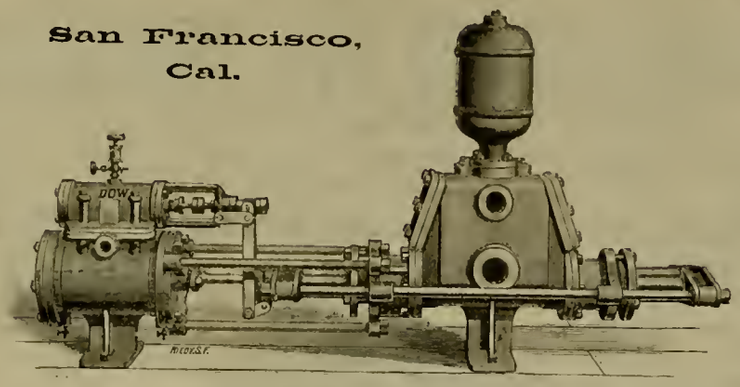

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DESCRIPTION OF PLATES:

Estimated Cost Complete.

PLATE 1.—Modern House of 8 rooms and laundry in basement, elegant and spacious staircase, hard wood mantels, brick foundation, electric bells and speaking tubes, modern improvements..... $4,500

PLATE 2.—One story and three-quarter Picturesque Cottage, with observatory, suitable for elevated lot, 14 rooms..... 5,500

PLATE 3.—Picturesque Cottage of 7 rooms and bath 3,750

PLATE 4.—Residence now building at 16th and Union Sts, Oakland, Alameda Co., Cal. (S. Davisson, Esq., owner)..... 3,500

PLATE 5.—City Residence of 0 rooms, Queen Anne style..... 5,000

PLATE 6.—Residence, 0 rooms and bath, built on Capp and 22d Sts., San Francisco. (C. Evans, owner)..... 4,500

PLATE 7.—City Residence of 8 rooms and bath..... 3,300

PLATE 8.—Hardwood Mantels, with tile hearths and facings, suitable for dining and sitting rooms and parlors.....

PLATE 9.—Cottage of 6 rooms and bath room, wooden mantels..... 3,000

PLATE 10.—Plans and Elevation of a 4-room and bath cottage..... 950

Plan and Elevation of 3-room Cottage, bath in kitchen..... 700

PLATE 11.—Residence 11 rooms, picturesque..... 8,000

PLATE 12.—Dwelling of 7 rooms, laundry and bath room, now building at Eureka, Humboldt Co., Cal. 3,500

PLATE 13.—Plans, Elevations and Details of a Cottage of 5 rooms, observatory and bath; laundry and wood and coal room in basement; brick foundation; cathedral glass, etc..... 2,750

PLATE 14.—Residence built at Eureka, Humboldt Co., Cal. (D. A. Boyd, owner)..... 3,000

PLATE 15.—Large Picturesque Country Residence, 10 rooms, large hall, paneled in hard wood, cathedral glass, etc..... 12,000

PLATE 16.—Residence of 9 rooms, built on Broadway and Buchanan Sts. (O. Helmrich, Esq., owner)..... 6,000

PLATE 17.—Swiss Combination Dwelling of 7 rooms and bath..... 3,750

PLATE 18.—Summer Residence, 8 rooms and bath, built at Santa Rosa, Sonoma Co., Cal..... 4,500

PLATE 19.—Cottage of 6 rooms, in the Modernized Queen Anne style, recently built in Centerville, Alameda Co., Cal. (C. A. Plummer, owner)..... 2,700

PLATE 20.—Residence of 6 rooms and bath, laundry, electric bells, mantels, etc., Filbert and 15th Sts.; also, on Market St., near 8th, Oakland, Cal. (J. C. Newsom, owner)..... 2,400

PLATE 21.—Residence of 9 rooms and bath, built on Peralta Heights, East Oakland, Cal. (Chas. Newton, Esq., owner)..... 4,000

PLATE 22.—One three-quarter story Residence of 6 rooms and bath room, built on Peralta Heights, East Oakland, Cal. (Wm. Price, Esq., owner)... 2,800

PLATE 23.—Cottage of 6 rooms and bath..... 1,800

PLATE 24.—One story and three-quarter Cottage, built on 0th ave. and East 14th St., East Oakland, Alameda Co., Cal. (J. W. Evans, Esq., owner); also, seven different stair details..... 4,000

PLATE 25.—Residence of 0 rooms and bath, built in Stockton, San Joaquin Co., Cal. (Wm. Swett, Esq., owner)..... 4,000
Also, seven different kinds of doors and inside finish.

PLATE 26.—Suburban Farm House of 7 rooms and bath, built on J. Lancaster's, Esq., farm, Los Gatos, Santa Clara Co., Cal..... 2,700

PLATE 27.—Residence of 6 rooms and bath, designed for Dr. H. Gardiner, Santa Clara, Cal..... 3,500

PLATE 28.—Dwelling of 7 rooms and laundry; built row of eight for Col. Samuel Wood; 9th St., bet. Brush and West Sts., Oakland, Alameda Co., Cal.; also, details of finish of same; also, of fence. Each house..... 2,600

PLATE 29.—1. Plan of Cottage of 5 rooms, laundry and bath room..... 1,900
2. Plan of Cottage of 6 rooms, laundry and bath room..... 2,000
3. Plan of Cottage of 5 rooms, laundry and bath room..... 1,750

PLATE 30.—Suburban Dwelling of 9 rooms, laundry and bath room, built in Santa Rosa. (T. J. Ludwig, owner)..... 3,750
Also, one and three-quarter story Cottage, with tower, 6 rooms and conservatory..... 3,000

PLATE 31.—Queen Anne Dwelling of 14 rooms and bath room, large hall and easy stairs, onyx mantels, cathedral glass, etc.; also, details of chimneys and inside finish..... 12,000

PLATE 32.—City Dwelling, 11 rooms, dressing rooms and bath room; also, saloon chambers; also, dining room mantel..... 15,000

PLATE 33.—Cottage of 6 rooms and 2 servants' rooms in attic, built on San Pablo avenue, Oakland, Cal..... 2,500

PLATE 34.—Residence designed for J. Rosenthal, Esq., to be built on Pierce and Hayes Sts., San Francisco. Onyx and hard wood mantels, tiled gables and cathedral glass, connecting bedrooms, balconies, etc.; 10 rooms, laundry and bath..... 9,000

PLATE 35.—Residence of C. Hirsfeld, Esq., on north side of California, bet. Pierce and Scott, 10 rooms and bath..... 5,500

The Plans are clear, and finely drawn on Lithograph Plates, and handsomely printed; size, 9x13 inches.

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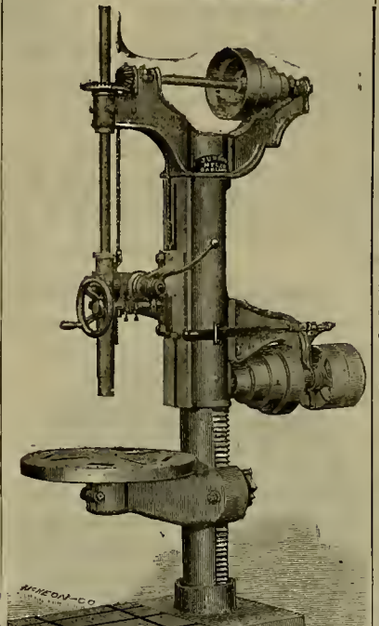

The above cut represents our new 26-inch Drill. This pattern is new and extra heavy. The material and workmanship is first-class in every particular. The spindle and head is counterbalanced with chain and weight, with a vertical adjustment of 20 inches. The spindle is made of hammered steel, bored out to fit the No. 3 Morse Drill Socket, and has 8 inches of travel. The quick return attachment is very strong, simple and perfect in its action. The face-plate swings round the column in any position. Can be raised or lowered 18 inches, and will receive work 32 inches high and 26 inches diameter. The bed plate is planed, and will receive work 46 inches high. The pinion and rack for lowering the table is placed on the side and revolves with the table. In this position, the dirt and borings falling from the table cannot get in the rack.

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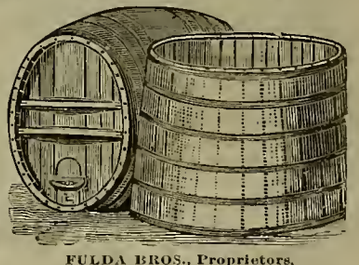

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Is hereby given that a meeting of the stockholders of the Lord of Lorn Gold and Silver Mining Company (a corporation) will be held on the 11th day of May, A. D. 1885, at one o'clock P. M., at the office of said corporation, in room No. 6, in building No. 318 Pine street, in the City and County of San Francisco, California, for the purpose and with the object: First, of increasing the capital stock of said corporation, so that the whole amount or par value thereof shall be $10,800,000, divided into 108,000 shares of the par value of $100 each; and, Second, to repeal the by-laws of said corporation, or any part thereof, and to amend the by-laws, or to adopt new by-laws therefor, as said meeting may determine. By order of the Board of Directors and Trustees, and of the President. March 7, 1885. JAS. T. McDOUGALL, President.
R. N. VAN BRUNT, Secretary.

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A one-half interest, or the whole, of a valuable GOLD MINE, situated in the Quartzburg Mining District, Mariposa County, Cal. This Quartz Mine prospects from $30 to $90 per ton in gold upon the pay streak, and will pay $15 per ton, average, for all the ores. It is a 3-foot ledge, and a double compartment shaft is now down 200 feet. A mill and reduction works are now well under way; a boarding-house completed, and a water ditch, and a large part of the machinery bought and erected; roads made, etc. The only reason for selling any part is, that the owners lack sufficient means to put the property into productive shape. For further information address, GILBERT CLEMENTS, 318 Front St., San Francisco.

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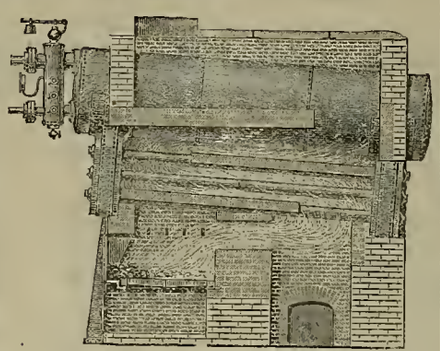
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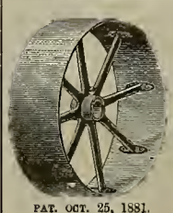
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THE ROLLER ORE FEEDER
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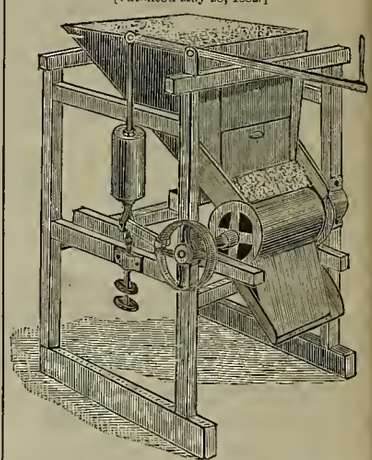
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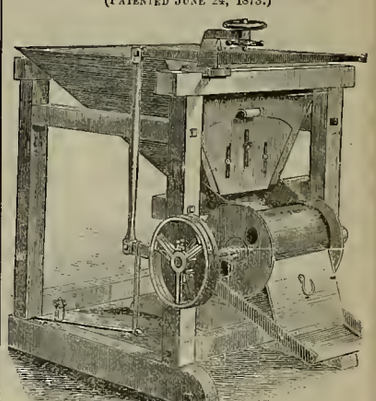
(PATENTED JUNE 24, 1873.)

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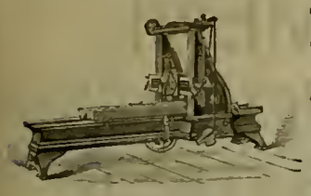

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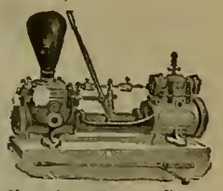

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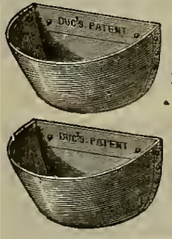

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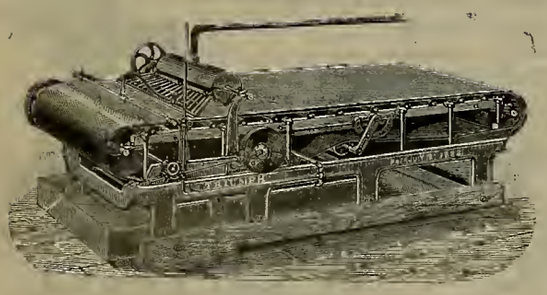

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PRICE, FIVE HUNDRED AND FIFTY DOLLARS ($550.00), F. O. B.

THE "TRIUMPH" TRIUMPHANT!

In a competitive trial recently had between two of the **"Triumph" Ore Concentrators** and the same number of **"Frue" Vanning Machines**, at the mill of the celebrated gold producing Original Empire Mill and Mining Company, in Grass Valley, Nevada County, Cal., the "Triumphs" produced thirteen and fifteen one-hundredths (13.15) per cent more concentrations than did the "Frue" Vanners, during a run of twenty-four consecutive days, or a net gold coin result of $199.15, or $8.30 per day, in favor of the two "Triumph" Concentrators.

These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with accurate deductions therefrom, will soon be published in Circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and **we hereby accept the Challenge of $1,000**, flaunted by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

We guarantee purchasers against all costs, expenses or charges incurred by reason of any infringements of any existing patents.

"Put up or shut up," and "Let the Best Machine win!"

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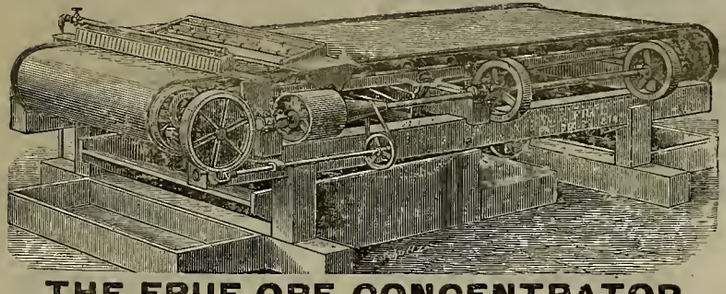

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OVER 1,000 ARE NOW IN USE. Saves from 40 to 100 per cent more than any other Concentrator Concentrations are clean from the first working. The wear and tear are merely nominal. A machine can be seen in working order and ready to make tests at the Fulton Iron Works, No. 220 Fremont Street, San Francisco.

As the result of a suit East against an End-Shake Machine (the Embrey), similar to the Triumph, the Frue Vanning Machine Company owns the Embrey patent, and can put in the market an End-Shake Machine of earlier patent that will do as good work as the Triumph, and superior in construction and durability. There will be no risk of suit for infringement.

The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement on patents owned by them.

Protected by patents May 4, 1869, Dec. 22, 1874, Sept. 2, 1879, April 27, 1880, March 22, 1881, Feb. 20, 1883, Sept. 18, 1883. Patents applied for.

N. B.—We are and have been ready at any time to make a competitive trial against the Triumph, or any other Concentrator for stakes of $1,000.

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DIVIDEND No. 22.—The Board of Trustees of this Company have this day declared the regular monthly dividend of Fifty Thousand Dollars, being one per cent on the capital stock, or Fifty Cents per share, payable on March 5, 1885, at the offices of the Company in New York and San Francisco.

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MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO, SATURDAY, MARCH 21, 1885.

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Number 12.

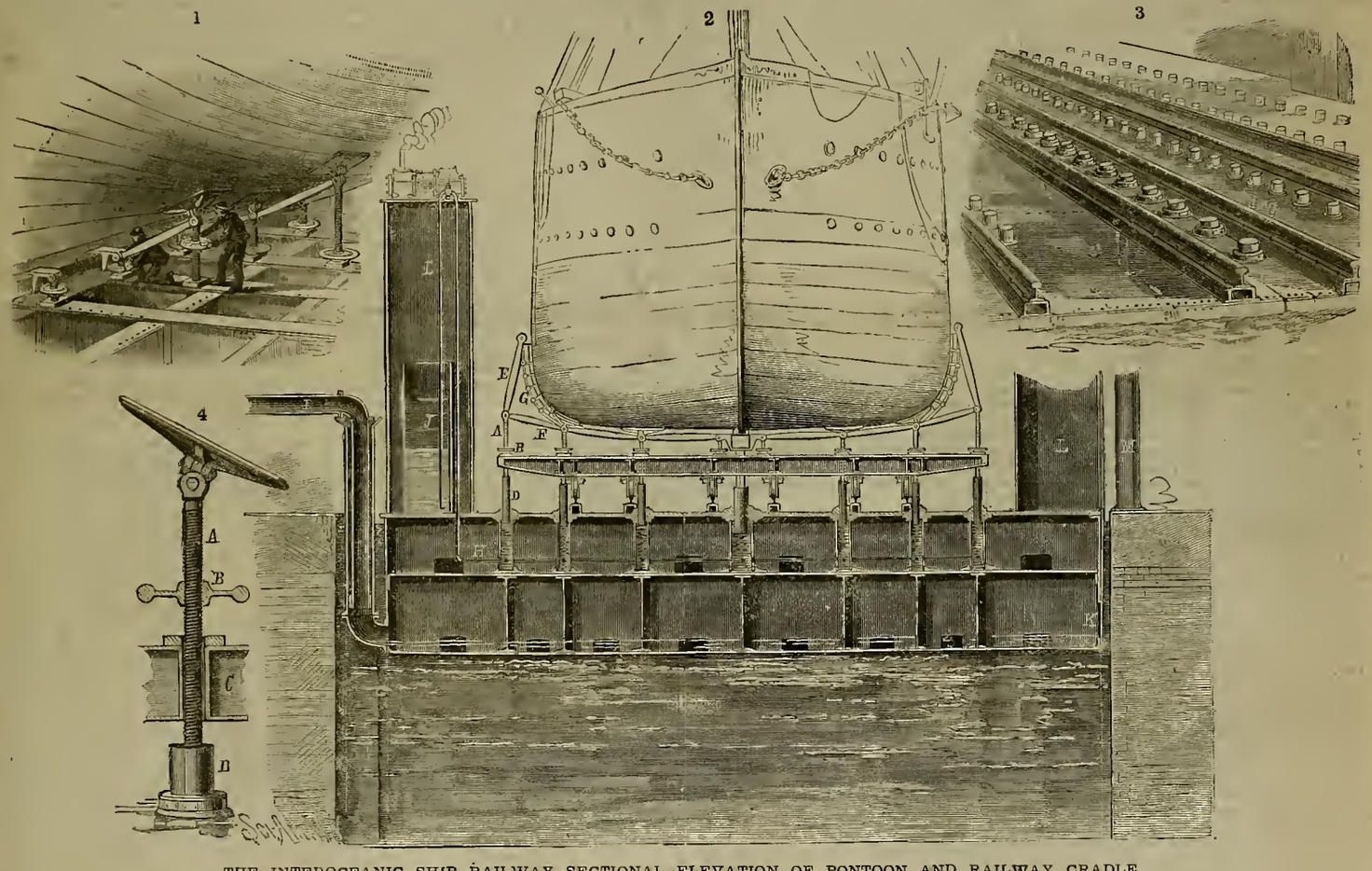
The Interoceanic Ship Railway.

The attention of the whole world has been turned to the projects for getting vessels from the Pacific into the Atlantic, and *vice versa*, across the Isthmus, so as to save the long and expensive sea voyage around the cape. The engineering difficulties are great, and opinions are at variance as to the best means of overcoming them. The transisthmian projects which for many years have attracted the attention of engineers may be divided, perhaps not improperly, into three classes: 1st. Those in which the construction will be at the mercy of floods. 2d. Those lacking good harbors. 3d. Those which empty into the Doldrums or Zone of Calms. Of these three fatal objections, the Panama tide water canal scheme is open to the first and third, and the Nicaragua lifting-lock plan to the second and third. The ship railway project of Mr. James B. Eads, illustrated in this number is open to neither of these objections. It is not so costly, and will shorten by considerably over 1,000 miles the contemplated route via Panama between the Atlantic States and this city or the East Indies.

This project of the ship railway is one devised by Mr. James B. Eads, the distinguished engineer, perhaps best known for the successful engineering displayed in the designing and construction of the Mississippi jetty system, which other engineers said would not work and which does work. The idea is a novel and original one, though it seems strange that no one ever thought before of its practicability. Mr. Eads hit upon the plan while studying the various canal projects, neither of which did he approve. He, of course, studied up carefully what might be brought forward as objections to his plan, and prepared to move its practicability.

He saw that by means of the ship railway he would reduce the distance from New York to San Francisco, necessary for vessels to traverse, which is 15,687 miles by way of Cape Horn, by some 10,000 miles; and from New Orleans to San Francisco from 16,112 miles to something less than 4,000. He knew there would be difficulty in making people believe the plan feasible. He remembered the difficulty of introducing hydrogen gas in London, of sending the first vessel across the Atlantic under steam, of substituting the screw propeller for the paddle wheel, and how the orignal projectors have been scoffed at. Mr. Eads knew that ships had been going on and off lifting docks without injury from time immemorial, and was sure that vessels that could safely withstand the terrible buffeting of ocean waves could be moved over a smooth roadbed without fear of injury. In order to be sure as to the roadbed, he took with him to the Isthmus, Mr. J. J. Williams, an able engineer, who had made several surveys for interoceanic railroads and canals, and Mr. E. L. Corthell, who had successfully carried out his plans at the mouths of the Mississippi, and is an expert in railroad construction, having been chief engineer of the West Shore Railroad. Being a practical man, Eads, naturally sought to discover a route that would furnish a substantial roadbed, possess something in the shape of harbors at either end, and above all a location outside of that, to the mariner, vexatious belt of perpetual calm. He found a cross section of the Isthmus of Tehauntepec which combined all these qualities; nay, more, for of all the routes across the narrow strip of land joining Mexico with South America, none shortens so much as this, the voyage from the Atlantic and Gulf States to California.

Having selected the site for his ship railway, he now sought a concession from the Mexican Government. This was obtained in 1881, and extends over a period of ninety-nine years from its date. It authorizes the construction across the Isthmus of Tehauntepec of a ship railway, an ordinary railway, and a line of telegraph. Besides this, it exempts all ships and merchandise *in transitu* from government duty, grants the concessionaire a million acres of public land, and guarantees protection during the construction and consequent operation of the works. To crown all, the right is given the company to obtain the aid of any foreign government, and in consideration of this assistance the company is authorized by the terms of the concession to discriminate in favor of the commerce of such government against that of all other countries, save, of course, Mexico. The concession obtained, Mr. Eads set about having a careful survey made, topographical and physical, for the several previous surveys were with reference to a canal or an ordinary railway.



THE INTEROCEANIC SHIP RAILWAY—SECTIONAL ELEVATION OF PONTOON AND RAILWAY CRADLE.

The length of the whole railroad line will be about 134 miles from Atlantic to Pacific. Beginning on the Atlantic side, the route will start from the Gulf of Mexico, the ships sailing up the Coatzacoalcos river to Minatitlan, a distance of about 25 miles. From Minatitlan there extends for about 35 miles an alluvial plain having an underlying alluvial stratum of heavy, tenacious clay. On the high land and ridges clay, loam and sand are found. Next comes an undulating table-land, and then irregular mountain spurs of the main Cordilleras, run through the entire continent, making at this point one of the most marked depressions to be found in its whole length. From this basis the line passes through a valley formed by a small stream to the plains of Tarifa, where is situated the summit of the line. This is 736 feet above low tide. After traversing these

(*Continued on page 190.*)

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

The New Gold Era.

EDITOR MINING PRESS: Your remarks week before last to the effect that we are on the eve of a new gold era in California, are pertinent and timely, being beyond any question fully warranted by the present situation in this State. The term "New Gold Era," is happily chosen, as it exactly expresses existing conditions, and the outlook here at this moment. There is certainly about to occur in this State a great expansion in the business of gold mining, the reasons for the sams being partially indicated in your editorial remarks, above referred to. Whether or not investors abroad are taking any more interest in that line of business than usual, is a matter about which I am not informed. That our own people, more especially the residents of the mining districts, are paying increased attention to it, is abundantly evident. Look where we will we see signs of renewed life and activity, quartz and drift operations, since the check given to hydraulic mining in its strongholds, having each experienced a decided impetus.

What you say in the PRESS about the mineral discoveries recently made in the Washington district and in the New River country is, I douht not, fully warranted hy the facts. As to the hydraulic deposits along the Klamath river, also alluded to, I can testify of my own personal knowledge that they surpass in value the most flattering accounts I have anywhere seen of them. These deposits, as you remark, do in themselves really amount to a great gold field. The linear extent of the auriferous territory along that river may, in some instances, have heen overestimated.

The gravel range on the Klamath, measured as the gravel deposits occur at intervals along it, do, indeed, reach for more than a hundred miles. Continuously, however, their extent is much less. Still, the material exsits there for many large operations and under couditions so favorahle, that one is surprised the field should have heen so little occupied. There are, along that river, opportunities for inaugurating anywhere from 20 to 30 hydraulic enterpriscs that, under anything like a good management, could not fail to prove eminently successful.

That this region has remained so long neglected is due mainly to its remoteness and difficulty of approach. Lying at the extreme northerly end of the main gold belt, hedged in by mountains, and far from railroads and navigable waters, it cau he reached only by a tedious and expensive journey. There obtains in this region the most primitive condition of tbings to he found in any part of California, there heing much here to remind one of '49 times. This is the only populous district in the State that remains without a wagon road connecting it with auy of the great water or land thoroughfares leading to San Francisco. From Fort Jones, at the lower end of Scott's Valley, or from Crescent City, on the coast, all goods are packed in on animals, these places being distant from Happy Camp, the cantral point, 70 and 90 miles respectively. A wagon road could he built from either of the above places at a moderate cost, yet the inhabitants, ahle to live iu a sort of easy independence, have never taken any action to that end.

As a matter of course, not much capital has, as yet, found its way into this regiou, nor have the inhabitants ever done much to induce it to come there. Nevertheless, I think there offer here some good openings for the employment of money, and would suggest to investors the wisdom of having the country examined to that end.

As thess [are hydraulic deposits, none but a person thoroughly conversant with that hranch of mining should he selected for the duty of making such examinations. Let a man like A. J. Bowie Jr., who is well up in hoth the theory and practice of the business, he sent on such errand, or equally well, send a man like James L. Gould, of Gold Run, George D. McLean, of Grass Valley, or James P. Pierce, James O'Brian, or Daniel McGanuey, of Smartsville, or any one of a dozen Californians who might justly he chosen for such service because of their long and successful experience in hydraulic mining, and I will answer for it there will he no disappointment, whatever the course either of these men may recommend the investor to pursue. With the approval of any one of them I think these mines on the Klamath might safely he taken hold of—condemned hy any one of their membor I should he disposed to let them alone. HENRY DEGROOT.

San Francisco, March 1-, 1885.

Tuolumne and Mariposa.

EDITORS PRESS:—The Red Cloud mine Co. in Mariposa county, a short distance from this place, have lately struck a rich hunch or "pocket" in their vein; it is estimated that they have taken out over $30,000. The company have frittered away considerable money in "pulverizers," "centrifugals" and other new fangled mills. They have now come down to the hard pan of good common sense, and will erect a stamp mill.

Lang and Shaw have their ten-stamp mill completed and will start up in a few days.

Ben Hunter is pusbing things on the Mt. Zion mine.

Richards, Tarwater and Tom Reid struck a good pocket on the Sonora road ahout half a mile from the town of Groveland, the rock was seen hy the writer and is no douht worth fully $2,000.

There is considerahle milling rock in sight. This pocket was only three feet to one side of main traveled road.

Between Waid's Ferry in Tuolumne county and Greely's saw-mills in Mariposa county there is perhaps a better country for prospectors and men who are on the work, provided they have a little means on which to prospect, than the hoasted New River or outside Territory mines. MICKEY FREE.

Groveland, March 7.

Mining Laws.

Locating Claims On Holidays.

A recent decision of the Secretary of the Interior, relating to the locating of mining claims on holidays, has attracted considerahle attention from the mining community, and some persons have thought these rights had been jeopardized. We have mentioned that the case referred particularly to Colorado, hut as the subject is one of great moment, we give Secretary Teller's decision entire, so that miners may understand the question in all its hearings. The decision is one which was addressed to the Commissioners of the General Land Office hy the Secretary of the Interior, and is as follows:

This claim was located in April, 1879, and application for patent was filed August 27, 1880. It was adversed hy claimauts of the Brian Boru Lode, alleging conflict with their claim to a narrow strip of surface ground. Suit was commenced thereon, and judgment rendered in favor of these claimants, January 28, 1882. On the same day the Favorite Lode claimants made entry for the remainder of their claim. On January 30th, McNeil *et al.* protested against issuance of patent on said entry, alleging failurs on the part of the applicants to expend one hundred dollars ($100) in lahor or improvements on their claim during the year 1881, whereby it became forfeited, and the premises hecame subject to relocation; and that the protestants relocated the same January 1, 1882, as the Oro Boys Lode claim.

It satisfactorily appears that the applicants complied with the requirements of the law, prior to the year 1881; that whatever

Assessment Work

They did during the year was doue in the month of December, and they did no work after the expiration of that year. The whole case is therefore narrowed to the single issues of whether or not the applicants performed the required labor or made the required improvements upon this claim during the month of Decemher, 1881; and if not, whether they performed such lahor or made such improvements upon the adjoining Continental Lode claim, of which they were owners, so as to answer the statutory demand in respect to the Favorite claim, and whether the premises were subject to relocation by the protestauts January 1, 1882.

Sec. 2324 R. S. provides that "on each claim located after May 10, 1872, and until patent has been issued therefore, not less than $100 worth of lahor shall be performed or improvements made during each year; * * * but where such claims are held in common, such expenditures may be made upon any one claim, and upon the failure to comply with these conditions, the claim or mine upon which such failure occurred shall he open to re-location in the same manuer as if no location of the same had ever heen made, provided that the original locaters, their heirs, assigns or legal representatives have not resumed work upon their claim, after failure and before such location."

It appears from the testimony submitted at a hearing, to ascertain the facts, that on Decemher 1, 1881, a written contract was made hetween the owners of the Favorite claim and one Williams, hy which the latter

Agreed to Develop this Mine

By tunnels and cross-cuts to the extent of at least 50 feet; said development to include the assessment thereon for the year ending Decemher 31, 1881, as required hy law, and to do and complete said assessment to the full value of $100, within the time named. The size of the tunnels was agreed upon, and the whole work was to he done "with a view to develop said mine on a systematic plan," and to "its permanency and full security;" and in compensation of his services, said Williams was to receive three-fourths of the net proceeds of all the pay ore extracted from the tunnels and cross-cuts during the continuance of the agreement, viz., to May 1, 1882. Williams forthwith commenced work upou the mine, assisted by his hired man, Johnson. The two worked upon sundry days during the month—sometimes together, and sometimes separately. Williams testifies that he kept a memorandum of such work (which he recites in detail), and that the value of their work, at miners' ordinary wages, amounted to more than $100. Johnson could not he found, and was not a witness at the hearing, but his affidavit accompanying the protest was filed, to the effect that not more than four or five days' work was done by both himself and Williams, the value of which did not exceed $15, and that no work was done hy either after December 24 h. In a later affidavit he says that he and Williams were working together upon several other mining claims during that month, and that he remembers of working himself for five days upon the Favorite, and may have worked more. He does not distinctly remember as to this, hut he does remember that he worked all day on this mine upon Saturday, Decemher 31, 1881. His general want of remembrance, and his contradiction in these affidavits upon material points, weaken his whole testimony, and do not detract from that of Williams. There is much conflicting testimony as to the value of this work; the witnesses for applicants testifying, in the main, that it amounted to $100 or more, and those for protestants that it was a less sum. But they all express opinions merely, without knowledge of the actual time expended by Williams & Johnson. Williams is the only witness who knows the real facts, and I find nothingin the case to discredit his testimouy.

Holidays.

But whatever might he the conclusiou in this respect, there are other questions pertinent to subject matter. The statutes of Colorado (p. 538, ed. of 1883), make certain days, among which is that of January 1st, holidays, and provide that in case any of said holidays fall upon a Suuday, then the Monday following shall he considered as the holiday. Sec. 137 (p. 51) of the Civil Code of Colorado, provides that a District Court of the State, or any judge thereof, shall have power to issue writs of injunction for affirmative relief, having the force and effect of a writ of restitution, restoring any person or persons to the possession of any mining property or premises from which he or they may have heen ousted by fraud, force or violence, or from which he or they are kept out of possession by threats or by words or actions which have a uatural tendency to excite fear or apprehension of danger, or whenever such possession was taken from him or them by entry of the adverse party on Sunday, or a legal holiday, or while the party in possession was temporarily absent therefrom; the granting of such writ to extend, however, only to the right of possession under the facts of the case, in rsspect to the manner in which the possession was obtained, leaving the parties to their legal rights on all other questions.

Sec. 1, ch. 41, of the Colorado statutes provides that no person shall enter upon or into any laud, tenements, or other possessions, except in cases where entry is given by law, and then only in a peaceahle manner; aud section 2 provides that if any person or persons shall enter upon any mining claim with force or a strong hand, whether any person be actually upon or in the same at the time of such entry or not, or if any person shall enter peaceably upon a mining claim, whether any person he actually upon the same at the time of such entry or not, and shall by words or actions which have a tendency to excite fear or apprehension of danger, frighten the party out of possession and retain and hold the same, or shall by such words or actions

Intimidate the Party Entitled to Possession

From returning upon or possessing the same, or shall hold and detain the same, the person or persons so offending shall be deemed guilty of a forcihle entry and detainer.

Sec. 30 (p. 726) of these statutes provides that in all cases when two or more persons shall associate themselves together for the purpose of obtaining the possession of any lode then in the actual possession of another hy force, violence, or hy stealth, and shall proceed to carry out such purpose by threats against the party in possession, or shall make any threats or use of language, signs or gestures, calculated to intimidate any person at work on said property from continuing to work thereon, or to iutimidate others from engaging to work thereon, they shall he subject to fine and imprisonment.

It is clear from the testimony that Williams and Johnson (or one of them) worked on this mine December 31, 1881; that when they left it on that evening their working tools were left there with the

Intention of Resuming Work;

That Williams returned to it early Monday morning for that purpose, hut found the mine in possession of protestants, who were armed, and informed him of their possession and that he could not work upon the mine. This possession was obtained after miduight of December 31, 1881, and prior to 7:30 o'clock A. M. January 2, 1882—upon Sunday, January 1st, or upon Monday, January 2d, which was a holiday—hy stealth, in the temporary absence of the applicants in violatiou of the laws of Colorado; and the applicants were prevented from continuing their work hy the language and conduct of the protestants, also in violation of said statutes. It was therefore a possession illegally acquired, and did not give the protestants the right to relocate the premises. A tortuous entry is unavailing for the purpose of a valid location of a mining claim. (Belk *vs.* Meagher, 104 U. S., 285). The Court further say in this case, that a mining claim perfected under the law is property in the highest sense of the term; that such claims are not open to relocation until the rights of a former locator have come to an end; that a relocator cannot avail himself of mineral in the puhlic lands until the discoverer has in law ahandoned his claim and left the property open for another to take up; and tbat a relocation on lands actually covered at the time by another valid and subsisting location is void.

In North Noonday Mining Co. *vs.* Orient Mining Co. (6 Sawyer, 299) the Court say: "Ths statute nowhere authorizes a person to trespass upon or relocate a claim hefore properly located hy another, however derelict in performing the required work the first locator may have been, provided he has returned and resumed work and is actually engaged in developiug his claim at the time the second locator enters and attempts to secure the claim." See also Jupiter Mining Co. *vs.* Bodie Cons. Mining Co., (7 Sawyer, 96.)

The present case is within these rulings. The applicants had not by intent or in fact ahandoned their claim, hut were in its actual possession, engaged in its development, when the protestants, hy a tortuous entry, attempted their ouster. Such action was illegal, and did not deprive the applicants of their rights, which remained the same as if they had completed their assessment work in 1881, even if this were not in fact done; with the right also to prosecute said work in 1882, and until a valid relocation was made hy another.

There is another conclusive

Objection Against the Forfeiture

Of applicants' claim on the ground alleged. The Continental Lode claim is adjoining to and parallel with the Favorite claim. They are both owned by the applicants. The required assessment work for the Continental for the year 1881 was performed. Work on the Continental was with the intent also to develop the Favorite. A drift in the former was run in the nirection of the latter, under the advice of mining experts, with reference to improvement of both. Work on the Continental was therefore, under the law, work on ths Favorite. The Court say, in Mt. Diahlo M. & M. Co. *vs.* Callison, (5 Sawyer, 439), "Work done outsids of the claim, or outside of any claim, if done for the purpose and as a means of perfecting or developing the claim, as in the case of tunuels, drifts, etc., is as available for holding the claim as if done within the houndaries of the claim itself. One general system may he formed well adapted and intended to work several contiguous claims or lodes, and when such is the case, work in furtherance of the system is work on the claim intended to be developed hy it." See also Smelting Company *vs.* Kemp, 104 U. S., 636, and Jackson *vs.* Rohy, 109 U. S., 440.

I am of the opinion that under the testimony the required assessment work for 1881 was done on the Favorite mine; but if there is douht of this under the conflicting proofs, then that the protestants, upon whom was the burden of proof, have failed to preponderate the same in thsir own favor, and thus show the delinquency of the applicants and establish their own claim. In Mt. Diahlo *vs.* Callison (*supra*) the Court say, "Forfeitures have always been deemed in law odious, and Courts have universally insisted upon the forfeiture heing made *clearly apparent* before enforcing it." For these reasons, as well as for what is above said in respect to work on the Continental mine, I think ths protest should be dismissed, and affirm your decision.

THE "SANTA ROSA."—Of the large line of steamers plying up aud down the coast, the *Santa Rosa* is rated ths best. The *Queen of the Pacific*, huilt and owned hy the Pacific Coast Steamship Company, the same company that owns the *Santa Rosa* and other coast steamers, for awhile was at the head of the list. Both are magnificent ocean steamers, most elegantly fitted and furnished, but the *Santa Rosa* has a slight advantage in speed. She has made the 200-mile trip from San Francisco to Port Harford, the San Luis Obispo port, in 12 hours and 11 minutes. She made the trip from New York to San Francisco, "around the Horn," in 45 days, which is the fastest long dis ance time on record. A representative of this paper recently had occasion to make the passage to San Diego on the *Santa Rosa*, aud experienced a very pleasant trip. The vessel is a modsl of heauty in hoth outline and interior decoration, being furnished in mahogany and cherry, paneled with embossed leather, and lighted throughout with the Edisou incandescent separable lamps. Her commander, Captain Johnson, is an efficient officer and a courteous and popular gentleman, and together with all his subalterns makes the comfort and safety of his passengers his first and last thought.—*Pacific States Watchman.*

THE outcome of the freight war cannot be guessed. It is believed that the cut hy at least one of the transcontinental lines has become so open that an investigation will be had, aud that many of the association lines will be implicated. The lines that are doing the cutting will maintain that the Transcontinental Association has lapsed, and that in cutting they have not violated the agreement formulated at the recent meeting of the association in this city, and which has not, as yet, been signed hy all the roads. On the other hand, the association will claim that the Executive Committee, hy its action in extending the time for signature to April 1st, hinds all the roads in the pool, aud if the charges against certain lines are made to stick, the roads will suffer hy the payment of heavy fines.

ALTHOUGH the Yosemite valley has heeu announcsd as open, and two parties have left via Madera within a fortnight, the reports received would indicate that the roads in the valley are in anything hut a fit condition for travel.

MECHANICAL PROGRESS.

[illegible] Friction.

M. Hirn communicates to the *Academie des Sciences* some observations on friction, with particular reference to machines and motors. He has arrived at the conclusion that there is a great difference between the friction of two surfaces sliding one upon the other, according as they are dry or separated by a layer of lubricating material. In the case of what he calls the *immediate* friction of bodies (*i. e.* those surfaces which are dry,) the co-efficient of friction is independent of velocities, areas or load. It is otherwise with the other order of sliding bodies, in which, as is generally the case, the surfaces are separated by an unctuous layer. Here the co-efficient of friction is always a function of the velocity, the load, and the extent of the sliding surfaces. It is difficult to arrive at exact laws which regulate the phenomena. The quantity of lubricant drawn under the rubbing surfaces by their movement, the temperature of the lubricant, etc., are capable of modifying the value of the co-efficient of friction many times in the course of a single experiment.

It may be broadly stated that, in the general condition of the ordinary machines, the power necessary to overcome friction is proportional to the square roots of the sliding surfaces and of the load, and (when the lubrication is abundant) to the velocity. The influence of velocity is above all complex. With great velocities, or at least when the loads are light in comparison with the frictional surfaces, a great number of liquids, very different from oils or fats, become lubricants. Air, under certain conditions, when brought in sufficient quantity between the sliding surfaces, becomes the best of lubricents; the co-efficient of friction being thereby reduced to one ten-thousandth. When, on the contrary, the speed is too low, or the load relatively too heavy, the unctuous matter may be expelled. The friction then becomes immediate, with a co-efficient rising to one one-hundredth or one-fifth. M. Hirn points out that these views are supported by some observations of M. Duprez, who found that the co-efficient of friction of a given machine, determined for a certain velocity and state of lubrication, diminished as the speed increased and the oil became warm; while, when the velocity was much diminished, the lubricant was no longer drawn between the surfaces in sufficient quantity, and the contact became as metal to metal.

United States Machinery in England.—The respect which the United States mechanical inventions have forced from British manufacturers and machinists, has originated the use of very different language by critics to that which was at one time indulged. When such people talk we do not hear much of the phrase "Yankee notions." A paper by Mr. George Richards, of Manchester, was read at the last meeting of the English Institute of Mechanical Engineers, giving an account, illustrated by diagrams, of improvements which had of late years been made in machinery for wood cutting, and especially in those known as the finishing class of machines, which were developed earliest in America. Mr. Richards put it in a very mild way when he said that the rapid manner in which these improvements had made their way in England showed that very little prejudice existed there with regard to the adoption of foreign ideas. For "foreign ideas" he probably intends that we should read American. Perhaps the prejudice will be much less when America has at the forthcoming International Inventors' Exhibition in London shown amongst other machines that one to which Sir Frederick Bramwell, as president of the Council of the Exhibition, has already asked the attention of the world.

A New Method of Melting Iron.—A new method of melting iron has been devised in Germany. The cupola is supplied with blast through two tuyeres, one above the other, there being 18 in each set; the tuyeres are ports, with the form of a vertical slat, directly connected with a tuyere ring. The particular feature of the cupola is that the bottom is a slightly inverted arch, which is pierced by two openings, through which both blasts, or rather imperfectly consumed gases of combustion, and the fluid iron, can flow. Below is a small chamber, in which the iron collects; it is heated by the gases forced downward from the cupola above, these being supplied with the necessary air for combustion by a small tuyere leading from the main blast pipe—the chamber at the same time serving to pre-heat scrap, etc., which need only be pushed into the bath for dissolving it. Of course, considerable quantities of scrap can be used by directly charging an ordinary cupola; but it is claimed that in this case the advantages presented are economy of fuel, and a greater facility for making sharp, strong castings and a purer description of metal.

Steel for Underground Colliery Purposes.—A novel feature, which may lead to a large demand for steel for underground colliery purposes, has been introduced by the Darlington Forge Company, which is executing considerable orders for large sections of channel steel to be used for roof beams in the place of wood in pit workings, and steel props are also making for supporting the roofs. The first cost of steel for beams and props is, of course, in excess of the wood supports at present used; but an ultimate saving will be effected in that they can be removed for further use without damage, which to a very large extent is not the case with wood, while an additional and very important advantage is secured in that much less space is occupied as compared with the heavy timbering now required, and a better working headway in the mine is obtained.—*Iron.*

Compositions for Cementing Iron.—According to the Technische Commerz *Zeitung*, a cement which will resist heat and water may be made by combining ten parts of lime, five of iron filings, two of vinegar and three of water; for objects which have to be heated, 100 parts of iron filings, 50 of clay, 10 of common salt, and 20 of quartz sand; for a black iron cement for iron ovens, 10 parts of iron filings, 12 of sand, 10 of boneblack, 12 of slacked lime, and five of lime milk; for fastening iron to stone, the composition may consist of 10 parts of fine iron filings, 30 parts plaster of paris, and one-half part sal ammoniac, these to be mixed to a fluid paste with weak vinegar, and applied at once; for a cement for iron cisterns, the finest iron filings are to be mixed with vinegar, which is to be allowed to stand until it becomes brown, and the mass is then pressed into the joints, of course, closely and firmly.

The Hammer in Forging.—Sir Frederick Bramwell, the President of the English Institute of Civil Engineering, declares that for the large steel forgings required in the present day for engine shafts and for cannon the operations of light steam hammers are positively hurtful, tending to produce internal flaws, and that the blows of even the heaviest hammers are less efficacious than pressure applied without a blow. He thinks the time is not far distant when all steel in its molten state will be subjected to pressure with the object of diminishing the size of any cavities containing imprisoned gases, or else that the same result will be obtained by other mechanical means, the possible nature of which he does not specify, but by which a casting may be obtained free from all blow-holes, so that, when afterward forged by pressure, and not by percussion, it may be trusted to contain no local defect.

The Use of the Power Indicator.—The importance of a careful study of the power required to run the different machines or departments of a shop or factory is well exemplified by the following: A recent test by indicator at a veneer mill, on Medford street, Boston, developed some interesting details. The friction of engine and shafting required 24.36 indicated h. p. The 56-inch Boston blower, for sawdust required 38.90 h. p., running 1,100 revolutions per minute. Here is a serious loss. Either the blower should be run slower or a different arrangement made. The use of the indicator would open the eyes of many a manufacturer who thinks it takes a large quantity of steam to run a stated amount of machinery.

A Fruitful Source of Damage done to boilers, and one which has ruined thousands, is the practice of blowing a boiler off and immediately refilling it with cold water, while the brickwork is red hot. The *Age of Steel* believes that nothing will tear a boiler to pieces quicker than this. Boilers have exploded with disastrous effect from this cause after the fire had been drawn. Probably most persons not familiar with the matter would be surprised to know the pertinacity with which cold water will cling to the lowest point of a boiler under these circumstances. Local contraction of such severity is thus induced that nothing can withstand its effects, and a few repetitions are generally sufficient to ruin any boiler.

Strengthening Steel.—In the course of experiments in France for the working of steel, M. Clemandot has developed the following process: He takes steel already made, heats it to a cherry red, and submits it by hydraulic means to a pressure of from 1,000 to 3,000 kilos per square centimeter. After the steel has been allowed to cool between the two plates of the press it is withdrawn, and found to possess a fineness of grain, a degree of hardness and strength to withstand rupture, superior to the qualities obtained by any other process. The alteration is most marked in highly carbonated steel.

To Detect Imperfections in Iron.—If a piece of iron appears to have an unsound weld, or if it has a crack apparent upon its surface, and it is desired to know how deep it penetrates, heat the part to be tested to a red heat and pour a fine stream of water on the faulty spot, but mainly on one side of it, and the iron on that side will lose its redness more rapidly than the other side, and plainly indicate how deeply the defect extends.

The Strength of Shafting.—To determine the size of shafting (wrought iron) Sellers, of Philadelphia, uses the following formula: Multiply the horse-power which it is desired to transmit by 125, and divide the product by the number of revolutions per minute, and the cube root of the quotient is the diameter of the shaft in inches.

Alloys are often difficult to make. It has been found that the presence of even 1-30,000 of a pound of antimony in a pound of melted lead increases the rapidity with which the lead oxidizes and burns. Lead which contains more than 1-1,400 of its weight of copper is unfit for the manufacture of white lead.

SCIENTIFIC PROGRESS.

Erroneous Ideas in Regard to Snakes.

Rheem, who has charge of the reptile specimens in the Smithsonian Institute, contradicts much of the popular belief as to snakes. Some of the most dreaded have no existence. The hoop snake, which takes the end of its tail in its mouth and rolls over and over like a hoop, killing everything it touches with its venom, and the blow snake, the breath of which is deadly, are fictions. As serpents move about they are constantly feeling ahead with the tongue, and the forward thrust and peculiar forked appearance of the organ has given rise to the false idea that with it the stinging is done. It is generally thought that there are a great number of poisonous snakes. In North America there are but three species—the rattlesnake, the copperhead or moccasin and the coral. There are about 30 varieties of these species altogether. The copperhead is probably the most dangerous, as it is vicious, and never gives warning of any kind before striking. The rattlesnake, though more poisonous than either of the others, will rattle at the approach of anything, and try to get away unless brought to bay. The coral is much smaller, and a native of the Southern States. The bite is not necessarily fatal if the proper remedies are used in time, as, on account of its size, the quantity of poison is small. When a reptile strikes he throws his whole body forward, and the fangs penetrate the object against which they come. He does not jump; the hinder part of the body remains in position, and none of our snakes are in the habit of reaching more than half its length.

Perspiration of Plants.—All plants give off moisture from their leaves, even though this is invisible to the eye, just as our skin is always perspiring, though the sweat may not stand in drops. This can be seen if a plant is grown under a glass shade, in such a manner that no evaporation can be given off by the earth or water in which it is grown. Nevertheless, in a few hours the inside of the glass will be dimmed by the moisture given off by the leaves, which has condensed on it. Calculations have been made as to the amount of water thus perspired by plants. A sunflower only three and a half feet high, with 5,616 square inches of surface exposed to the air, gives off every twelve hours twenty to thirty ounces avoirdupois of water in this form, which is more than a man does. Most of the common agricultural plants, such as wheat, beans, peas and clover, exhale during the five months of growth more than two hundred times their dry weight of water. The cornelian cherry is still more remarkable. In the course of twenty-four hours it exhales water equal in weight to twice that of the whole shrub. Naturally the degree of light, warmth and dryness of the air affects the amount of fluid given off, as well as the age and texture of the leaf. However, a calculation of the amount of fluid perspired by an acre of cabbages may be curious. If the cabbages are planted in rows of 18 inches apart and 18 inches from each other, it is estimated that in the course of 12 hours no less than 10 tons 4 cwt. 3 quarters and 11 lbs. weight of water will have been insensibly perspired by their fleshy leaves.—*Science for All.*

The Action of Light on Milk.—Direct sunlight very soon spoils milk or cream by premature souring and decomposition. The effect of indirect or reflected light has been but little observed. It nevertheless exerts an active influence, not only upon milk and cream, but upon butter and cheese while curing. The general effect of light upon cream is to hasten the action of the lactic yeast, and then the formation of alcohol, and after that to hurry up putrefaction, and these changes are occasioned by the influence of reflected light the same as direct light, only in a feebler degree. The first effect, however, of a small quantity of reflected light—a quantity that would enable one with good eyes to read ordinary print—is to heighten the color of cream during an exposure of 36 hours to 48 hours. As soon as the quantity of light allowed to fall upon milk is increased beyond the small amount named, its influence is soon manifested upon the cream, causing it to become sour and stale, lose color and flavor; and if the light is strong, its surface is soon covered with mould and pimples, when the milk standing in a shaded position will be all right. The conclusion is that too much light is often the cause of faulty butter, and even butter will fade if exposed to the light though it be in brine.

Importance of Scientific Knowledge.—A well-grounded knowledge of the great law or principle of conservation of energy should be taught with the multiplication table. It can be so taught if the teachers themselves are certain that there is in the universe only so much energy, and that we cannot make one particle more than already existed. With a clear understanding of this principle, no time will be wasted in search after perpetual motion machines, and fewer mistakes will be made by really earnest seekers after improved machines for use or improved methods. When a young man brings to me some wonderful improvement over the ordinary crank motion, some device that is to supersede the crank of the steam engine, a feeling of utter helplessness comes over me. I know not how or where to begin; he has had no opportunity to learn the simple laws of mechanics, and to point out the fallacy of his argument means to teach him the laws of mechanics, so I can only say to him. "Don't," and may advise him what books to read.—*Coleman Sellers.*

A Piano-violin.—A novel musical instrument called a piano-violin is the subject of a patent recently issued to Messrs. J. Parsons and J. W. Trinkle, of Kent, Ind. A case is provided containing two sounding boxes, one resting behind and connected to the other. To the front side of the inner sounding box is secured a bridge transversely to the box. To the front of the bridge a series of jaws are secured, between which the string bars are passed, the latter of which are provided with a spring tongue. An endless belt is made to pass by the strings in the instrument by means of a treadle, and as the keys are depressed, the corresponding strips will be drawn upward, bringing the lower end of the corresponding string bar toward the belt, which coming in contact with the string produces a vibration and sound as long as the belt is kept in contact with the string.

Experiments in Magnetism.—Among the most notable results of recent experiments in magnetism is the discovery of a peculiar property possessed by a magnetic body. The explanation in this case is that not only can the molecule be rotated through any degree of arc to its maximum or saturation, but that, while it requires a comparatively strong force to overcome its rigidity or resistance to rotation, it has a small field of its own through which it can move with excessive freedom, trembling, vibrating or rotating through a small degree with infinitely less force than would be required to rotate it permanently on either side. This property, it is said, is so marked and general that it can be observed without any special iron or apparatus.

Manufacture of Gunpowder in the Wet Way.—M. Nordenfelt has taken out a patent in France for making gunpowder as follows: The requisite quantity of sulphur is dissolved in sulphide of carbon, and this solution is then mixed with the carbon, which, instead of charcoal, as in other methods of making powder, is cotton or some other cellulose fiber, which is reduced to an impalpable powder. Finally, to this mixture is added the proper quantity of a saturated solution of saltpeter. This mixture is then evaporated and the crystallization is broken up, or it is evaporated in a vacuum. It is asserted that the process gives a more perfect incorporation of the several substances than is possible in the dry manufacture.

The Moon's Influence.—Those who yet cling to the old-time faith in the moon's influence upon the weather may be interested to learn that so eminent a scientist as Sir William Thompson has recently felt called upon to declare that careful observation with the barometer, thermometer and anemometer have failed to establish any such influence; on the contrary, that if there is any dependence of the weather upon the phases of the moon it is only in a degree so slight as to be quite imperceptible to ordinary observation. Careful observations in the same direction, made by Dr. Gibbons, of this city, and continued through a series of more than 30 years, fully confirm the statement of Sir William Thompson.

Rapid Growing of the Coral Insect.—After a cruise of a few months in the South Pacific, a French man-of-war was recently found to have specimens of living corals growing upon her hull. The interesting discovery has thrown some light on the question of the rapidity of growth of corals. The evidence tends to show that the vessel, on passing a reef of the Gambier Islands, against which she rubbed, had picked up a young fungia, which adhered to the sheathing and grew to a diameter of 9 inches and a weight of two and a half pounds in nine weeks.

Measuring the Expansion of Explosives.—Experiments with gelatine dynamite have shed a curious light on the expansion of explosives. The test is made by inclosing the compound in a cavity of lead whose walls are very thick, capable of uniform attenuation, but resist rupture until the last limit of tenuity is exhausted. By exploding thirty grammes of No. 1 gelatine dynamite in a cavity whose capacity was fifteen cubic centimeters, the space was enlarged by 1330 centimeters, nearly in the ratio of 1 to 90.

Developing Electricity.—Mr. R. A. Proctor says that electricity might be obtained by utilizing the heat of water applied to the junction of two metals; but the current produced by a temperature of 160 degrees Fahrenheit at one junction, and say 60 degrees Fahrenheit at the other, would be too small to be commercially successful.

A man has invented a coiled-spring attachment to a sewing machine, clothes wringer, etc., by which, and a crank, the old man can store up power enough before he goes to business to run the house all day. President Cleveland will avoid the necessity for this, not being a family man.

A New Link.—A German chemist has obtained a new link between the vegetable and animal kingdoms in the shape of an animal gum closely resembling the plant gums in its physical and chemical properties.

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SAN FRANCISCO:

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Passing Events.

The long expected rain came at last this week, and though not as widely extended as was hoped, has done much good.

The labor strike in this city is over, and the men are all at work again, though the iron industry still continues in rather a depressed condition.

War and rumors of war in Europe form the topic of conversation among readers of dispatches. Any serious complication between the great powers generally brings money into the pockets of American merchants and farmers, and the results of the present differences are watched with interest.

A number of men are going into the northern California mines already, though they are advised hy those who know, that it is yet too soon to do any prospecting in the regions referred to.

A new commissioner of patents has been appointed hy the President, and inventors and agents are in hopes that he will he able to arrange matters at the Patent Office so that the work will he caught up with once more, and the affairs of the office he more rapidly conducted hereafter.

THE President has nominated Wm. Garrard, of Nevada, superintendent of the Carson mint, to take the place made vacant hy the death of Superintendent Crawford.

AT the Union Iron Works enough laborers have been secured to carry on the work, and the men who struck for $2 a day are out of employment.

Develop Your Gold Claims.

It is very evident from the course of events that from this on a great deal more attention than formerly will he paid to the development of gold properties. Gold mines are in demand. There are plenty of regions where silver, copper and lead are more or less abundant, hut not many where gold is found. California "has the call" on this class of properties, as it has had for years. For the past ten years or so, however, our mining capitalists have been going to a distance for claims, to the neglect of home mines. But, notwithstanding this, California has kept up its production very well, ranking second of all the States and Territories in bullion production, although the Territories count in their totals their copper and lead, while we count only our gold and silver. Since the prohihtion of hydraulic mining our gold product has somewhat fallen off, it is true, hut by no means as much as was expected. The reason for this is that men have looked more carefully after quartz interests, and have opened and developed more of that class of mines.

With the low price of lead and copper, and the heavy discount on silver, people are beginning to think more of gold claims. There is therefore now quite a demand for them. Miners who own gold prospects will therefore do well to go to work on them and try and prove them up. There will be no trouhle to dispose of such claims in the future at good prices, if they are at all promising. Time was when miners could not sell gold claims at all, hecause buyers were looking in other directions. But this is changed, and the change is to the advantage of California miners.

Throughout this State there are regions where there are many small undeveloped or partially prospected ledges which ought to he worked enough to prove at least their value. It behooves these owners to start at work on them. Instances are occurring every day which show the propriety of this, where claims have laid idle a long time and a little work has finally shown them to he of value. People from other regions are now once again looking toward California for investment, and wherever there there are mines of any fair promise at all money can be found to put them in shape to he productive.

New York Cable Railway Company.

The new commissioners appointed hy the General Term of the Supreme Court under an order of December 1, 1884, consisting of Guy R. Pelton, Chairman, William C. Traphagen and Le Roy B. Crane, who are to report whether the twenty-nine cahle railway routes designed hy the rapid transit commissioners, acting under the law of 1875, should now he constructed, lately commenced their proceedings in New York City.

There is a very vigorous opposition from the existing horse-car and elevated roads, and also from the property owners interested in the several routes. Many protests have been put in questioning the legality of the appointment of the commission, and the property owners along the first route designed, namely, from Harlem river through Lexington avenue, Grammercy Park and Irving Place, and through streets to be opened hy hreaking through property, to he condemned from Fourteenth street to the Battery, have combined to resist the project in every availahle manner.

The cahle company offer a very popular program, proposing to construct 70 miles of railroad through the city, partly elevated and partly surface, and to charge a fare of only five cents per passenger, with the privilege of transfer from one route to another.

The scheme was planned by General Veile, and the capital is supposed to he supplied hy the Standard Oil Company and the New York Steam Heating Company combined, hut the strength of the vested interests, as well as the sense of property owners along several of the lines, seem to present an insurmountable barrier to the accomplishment of this hold design.

A DISPATCH from Berlin, dated the 8th inst. says: Two hundred and seventeen miners were imprisoned hy an explosion of fire-damp in a colliery at Camphausen, near Saarhruck, in Rhenish Prussia, this morning and at a late hour this afternoon, hut seventeen had been rescued. It is feared that most of the 200 others have been suffocated.

Treatment of Copper Ores.

The ore of most frequent occurrence is copper pyrites, which is, however, usually associated with iron pyrites or with other compounds of iron or copper. In the Rocky mountains iron pyrites is seldom the preponderating mineral, although in other places it is, and therefore the surface ores are usually, in the northwest, as in Montana, rich oxysulphurets merging in some mines into purple ore; and in the southwest, as in Arizona and New Mexico, carhonates and oxides, associated with more or less oxide of iron and manganese.

These differences in the composition of ores necessarily involves a difference in treatment. If we run down in a cupola furnace a sulphuretted ore of iron or copper, carrying more or less quartz, lime and earthy matter, there will result a slag carrying all the silica, lime, alumina, and perhaps some of the iron of the sulphurets; and a matte carrying all or nearly all the sulphur, combined with the copper and most of the iron.

The results will he little hetter than would have been obtained by a careful concentration of the ore, which would have removed the light gangue from the heavy mineral. But if, hefore smelting the ore, it be thoroughly roasted there is eliminated the sulphur as sulphurous acid gas, and the iron and copper are converted into oxides. If, now, this roasted ore he put into a cupola furnace the siliceous and calcareous gangue is slagged off as before, and if enough silica he present all the iron which existed in the pyrites will he similarly disposed of, while the copper oxide will he reduced hy the action of the carhon of the fuel, and can he tapped out as metal. As Nature has, in the prominent mines of Arizona and New Mexico, oxidized the copper, and has done it in many cases most perfectly, the treatment is there simplified to a single reducing fusion in a cupola furnace, whereas the sulphuretted ores of the Atlantic coast and of Montana, and also those occurring in the Northwest, must h first oxidized artificially.

The practice of copper smelting in this country has been thus summed up by Mr. James Douglas:

On the concentrates from the native ores of Lake Superior, which are subjected to a single fusion whereby the copper is separated from associated iron, oxide and silica, preparatory to a refining operation in the same furnace.

On the carhonate ores of Arizona and New Mexico, which are worked exclusively in cupola furnaces, and which yield to a single furnace a coarse copper which is shipped East for refining.

On sulphuretted hoth at certain mines and at certain estahlishments in the East. When the ores are hasic the cupola furnace is used; when silicious the reverheratory. At some mines and at one of the coast works hoth cupolas and reverheratories are used.

SUTRO TUNNEL.—The receipts of the Sutro Tunnel Company for 1884 were $144,457, including $125,623 from royalties. This is an increase of $54,102 over the amount collected on royalties in 1883. The dishursements were $143,643, including $43,231 on mortgage interest, leaving $814 cash on hand. The old officers have been re-elected as follows: President, Charles W. Brush; Treasurer, London, Paris and American Bank; Secretary, Pelham W. Ames; General Superintendent, C. C. Thomas; Trustees, William Johns, Thomas P. Stoney, R. H. Pond, David Cahn, Charles W. Brush, Hugh Marshall, Pelham W. Ames.

A STATEMENT prepared by Louis F. Holtz, assessor of San Francisco, and attested hy Mayor Bartlett, has been laid before the New York Cahle Railway Commission, showing that the value of property on certain streets in San Francisco has been greatly increased hy the construction of cable roads, while on the horse railroad routes it has correspondingly decreased.

A CARLOAD of nickel and cohalt ore has been shipped from the Cottonwood mines, Lovelock, Nev., to England. Mr. Lovelock has made arrangements with a French company to have the mines worked steadily. A number of men are now employed on the mines, and regular shipments of ore will he made henceforth.

MARTIN V. MONTGOMERY, of Lansing, Mich., has been appointed commissioner of patents hy President Cleveland.

American Machinery for the Soudan.

Several telegraphic dispatches have lately appeared in the daily papers, stating that the English Government had contracted with some American firm for the supply of pumping machinery for the desert between Suakim and Berher, and this seems to have rather surprised the English manufacturers; so much so that through some of their representatives in the House of Commons, inquiry was made of the government for the reason for so doing, the reply heing that the American firms were more experienced in the manufacture of pumps for pipe lines, and with their facilities could complete the work in less time than the English. It seems that the English Government is intending to huild a railroad from Suakim, on the Red Sea, to Berher, on the Nile, a distance of 264 miles, and this over a desert where no water can be obtained; so the plan has been suggested of pumping water the whole distance in the same manner in which oil is pumped through the pipe lines in Pennsylvania. It is understood that Englaud is shipping a certain amount of material and machinery for the construction of the road in five-mile lots; that is, a vessel will take five miles of track with all its appurtenances and rolling stock, with tools and accommodations for such laborers and other employes as may he required, so that in the case of the loss of any one vessel any other vessel arriving, her cargo will immediately take the place of the one lost. This is a much hetter plan than shipping a part of the material hy one vessel and the rest of the material for the complete construction of that section in one or more other vessels, as in that case, if one vessel is lost, a new shipment would have to he ordered before the partially constructed section could he finished.

Henry R. Worthington, of New York, has received the contract for several pumping engines, which are of the usual duplex non-condensing type, calculated to work under a pressure of from 1,000 to 1,500 pounds per square inch, and with a capacity of from 150 to 200 gallons per minute.

The pipe for this service is to he four-inch wrought iron, and the works have offered to furnish fifteen miles per day.

If this project is carried out to its fulfillment, and there seems no doubt of it, it is the heginning of the solution of the development of one of the now greatest unknown regions in the world, and will in a great measure determine the superiority of the Christian versus the Moslem.

COAST COAL.—Just now in this market coal is demoralized and very cheap and dealers are cutting prices right and left. A private circular sums up the situation as follows: The market is heing crowded heyond its capacity, principally hy our coast productions; the ambition of the local agents here appears to he, which will dispose of the largest amount for the least profit, and they have successfully demoralized this branch of trade. Our consumption has diminished materially, hence the coal yards are taxed to their utmost capacity, so that any unsold cargoes arriving this month will have to he sacrificed for want of storage room. Another new colliery is bidding for public favor, certainly an inopportune time for profitable introduction. How long this slaughtering of prices will continue is a query; the remedy is in the hands of a few of our coast colliery agents, who must limit their output to hetter the market.

PROVIDENCE MINES.—Our representative's letter from the Providence mining district shows that there is much truth in the old adage that "Competition is the life of trade." When there is no competition there is little or no activity in any business. There is one first-class and well conducted mine, the Bonanza King, working at Providence. Adjoining this mine are prospects that look better than the King did at the start. All that is needed to have a number of bullion producing mines that would equal if not excel the Bonanza King, is capital and a similar business-like management. This district is San Bernardino's hest, and at no distant day it will take its proper place among the leading silver producing camps of the State.

THE Hanauer smelter, Utah, formerly the Morgan, has resumed operations after a suspension of nearly two months.

Air Currents in Mines.

A consideration of the subject of spontaneous combustiou iu mines iuvolves eome knowledge of facts concerniug the temperature and moisture of workings of coal mines in summer and in winter. The subject is also closely connected with falls of roof and sides. It is a fact that when blasting was not restricted in fiery and dusty mines in England, explosions were more frequent in winter than summer. On cold days dry and dusty mines are drier, and the dust more inflammable than on warm days. Some experiments recently made by one of the English Governm at mine inspectors, go to prove interesting facts. The hygrometer was placed as nearly as possible equidistant from roof, sides and floor.

The highest and lowest temperatures observed were—in summer, 88°, 62°; in winter, 84½°, 62°. The greatest and smallest amount of moisture in a cubic foot of air from the first working place to the return air was—in summer, 11.1 grains 3½; in winter, 9.55 grains 3½. The observatione showed how quickly and readily the air assumed the temperature of the surrounding strata, which was, of course, independent of surface temperature, and that the difference between the quantity of vapor in a cubic foot of air on the surface and in the returu air was greater the lower the temperature was on the surface. The colder air was the less moisture it was likely to contain, and its absorbing power for moisture, and consequently its drying power increased the hotter it became.

Several observations showed greater temperatures in unventilated placee and gohs than in the air current close by. On diverting the air current from waste in some seams the amount of vapor in the air increased after a few minutee, whilst the temperature remained pretty constant. This pointed to slow combustion in the gob. The time when workings would have reached the greatest workable depth was still remote. Air, under ordinary pressure or uncompressed, would avail little towards increasing the workable depth in extensive workings, owing to the air so readily assuming the temperature of the surrounding rock.

Sierra County Mines.

The Bald Mountain Extension Company at Forest city cleaned up this week for six days' work of 45 mcu, 120 ounces, 12 pennyweights, at $18.60 per ounce, which sold for $2,233.16. The face of the main tunnel is in soft picking bed-rock and an npraise has just been started there, for the pay gravel above promises, by the indications in sight, to be rich in gold. The new wire cable at the incline is working nicely and everything in the mine appears favorable for future succes. A private letter states that a miner just down from the Ruby says that 45 men are now employed there and the clean-up was expected to be very good.

Hon. C. W. Cross, State Senator of Nevada county, arrived at Downieville on Monday to inspect the quartz ledge that he has agreed, with others, to purchase of Jereme York, provided the developments satisfy him. The property is valuable. The mine, as heretofore stated in the PRESS, is up Slug canyon. He says there is enough quartz in sight that will pay to mill to last fully a year. It costs $1.50 to mine and $1 to mill a ton of the ore, leaving a wide margin for profit. The water is about all pumped out of the Marguerite shaft near Sierra city and the mill will be started in about two weeks, unless unexpected obstacles prevent. The miners are all fervently praying for storm, fearful if it does not come soon in the form of a bountiful snow fall, that their water season will be too brief for much profit.

NEW RIVER TRAIL.—The trail from Etna to New River, via Sawyer's Bar, Black Bear and Yocumville, just now commends itself as being the best, nearest and quickest route to reach the new El Dorado. The fact that pack trains are making regular tripe between the two terminal points, while all other trails are closed, merits the consideration of those who wish to visit the mines early.—*Yreka Union*.

FIVE DAYS' RUN from the Modoc furnace at Darwin, Inyo county, Cal., produces 72,318 pounds of bullion, valued at $10,594.96. The ore containe 36 per cent of lead, 69 ounces of silver and $12 in gold per ton.

Providence District.

(From our Traveling Correspondent).

This mining district is situated in San Bernardino county about 120 miles east of Calico; being 24 miles north of the line of the A. & P. R. R. Fenner station is the shipping point for supplies and ore. Daily communication is had by H. J. Young's stage and express line. Comparatively speaking, the district is a new ous. The mineral belt lies nearly north and south, extending a distance of nearly eight miles aloug the east slope of Providence mountain. The contact is a quartzite granite and porphyry, with lime formations between clay walls. Rich chutes and deposite of ore of quartz spar and carbonized zinc, are the principal milling ores. These ore bodies and vein matter exist with more regularity and firmness than in Calico, and depth demonstrates a concentration of the ore bodies indicating strong probabili ies of the existence of a true fissure vein.

The Mines.

The development of the mines of Providence, as yet, is not extensive, for so promising a district. The Bonanza King is the leading, and in fact the only mine in the district, the others being merely prospects, a few of which, however, already promise to rival the Bonanza King in the future. The King is now down on mineral to the depth of about 800 feet. The mine is worked through a shaft hoisting the ores by machinery. A net-work of drifts, stopes and tunnels have pierced and cross-cut the ground between the walls from the surface to the 800-foot level, exposing numerous rich deposits and stringer veins of ore more or less broken near the surface, but more concentrated and uniform at the lowest depth reached. The output of the mine is now about 25 tons per day. The ores will probably average from $50 to $100 per ton, producing from $35,000 to $50,000 bullion per month. About 100 men are employed, $3.50 being the wages paid. Board costs $8 per week, the company having the charge of the boarding-house. On the 5th of every month some $20,000 is paid out by the company for wages and supplies. Pay-day is never postponed, and no checks are used, coin currency being the legal tender used by the Bonanza King Co. in promptly and regularly paying their bills. This mine is now owned by a few eastern capitalists. Mr. Wilson Waddingham, of New York, is president; Samuel Kelley, general manager; H. C. Callagban, superintendent, and M. S. Bates, chief clerk—Messrs. Waddingham and Kelley owning the most of the mine. The PRESS representative is indebted to the above mentioned gentlemen for courtesies extended. This property being owned by individuals who seek no notoriety and who are venturing their money, and so far have reaped a golden harvest, but little as to the mine's output is reported to the public. Since the erection of the company's mill, about two years ago, some $1,500,000 in bullion has been produced.

Ore Treatment.

The Bonanza King mill, at Crow Town, a mile and a half distant from the mine, is the only mill in the district. It is a 10-stamp dry crushing process, somewhat similar to the "Boss" process, only that it is not continuous. The ores are dried after passing through the ore crusher. The batteries are supplied by self-feeders. From a car the dry crushings are started into pans, and afterwards pass through the settlers. The tailings are caught in tanks, the water drained off and pumped back in an elevated tank to be used again and again. This being advantageous on account of saving water, and the water repumped being a thorough salt solution, thereby saves much salt. The tailings are shoveled into cars and dumped from a high trussle-work near by. The mill has a capacity of twenty-four tons per day, and is in charge of Mr. E. Huhn, a thorough metallurgist, and he estimates the cost of milling the ores of the district at the company's mill to be $6.50 per ton. Wood costs $8 per cord, water being supplied from the company's springs.

Good Prospects.

On the north of the Bonanza King, the two pioneer miners of the camp, Messrs. Gorman and Dewyre, have opened up and developed quite extensively a claim quite similar in formation to the Bonanza King. The King mill has crushed some of the ores of the Bell McGilroy, this being the name of G. & D.'s mine, and returns net the owners $60 per ton. The ores average about 100 ounces. The development so far is merely surface work, only fifty feet having been made in depth.

The Cook and Thompson group join the Belle McGilroy further north. This group consists of a number of claims more or less developed, and so far as worked show up excellent. Some of the ores in stringer veins being unusually rich. Some shipments of ore from the Mineral Point mine of this group has been made to Kingman, and the returns have shown the majority to be of a high grade. All, or nearly all, of the ores of this district are free milling. Nothing lower than 100 oz. ore will pay to freight to Fenner or to a mill.

The Perseverance on the south is one of the best looking prospects on the belt. One claim lies between the Bonanza King and the Perse-

(*Concluded on page 196.*)

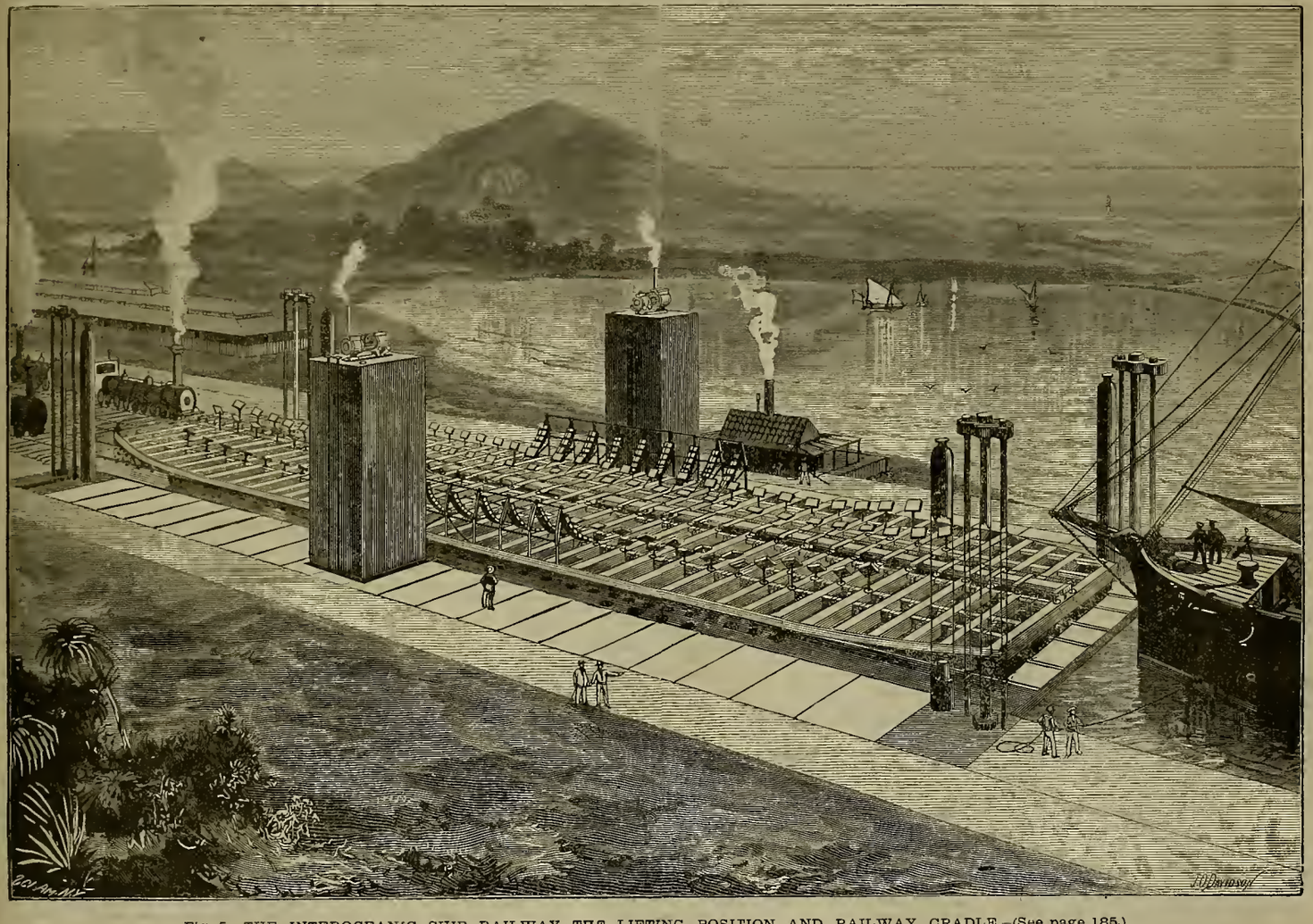

FIG. 5.—THE INTEROCEANIC SHIP RAILWAY—THE LIFTING POSITION AND RAILWAY CRADLE.—(See page 185.)

The Interoceanic Ship Railway.

(*Continued from page 185.*)

plains, the Pass of Tarifa is reached. This is the most accessible of the many passes in this depression in the mountain chain. From here the line gradually sinks to the Pacific, reaching the plaios on this side 118 miles distant from Minatitlan.

From New York to San Francisco *via* the Paoama Canal, a steamship would he compelled to pass the Isthmus of Tehuaotepec, sail south a long distance, aud after crossing sail north again the saine distance before reaching the short route to San Francisco. In other words, she would have to traverse ahout 1,200 miles more than if she had crossed the Isthmus at Tehuantepec. From Gulf ports to San Francisco and the East the difference in distance in favor of Tehuantepec is still more marked; the route between New Orleans and Sau Fraucisco *via* Tehuantepec heing about niueteen hundred (1,900) miles shorter than *via* Panama. From Liverpool to San Francisco there is a saving of 600 miles *via* Tehuantepec. With sailing vessels—and sailing vessels, much as we hear of steamers, carry fully three-quarters of the world's freights to-day, and are likely to continue to carry slow freights—the contrast is still more marked. However, sailing vessels which are floated across the Isthmus *via* Panama are left in a regiou of almost perpetual calm, and have to go hundreds of miles before reaching the trade wind regions. It would he a generous estimate to allow for only ten days'—good authorities say from 20 to 30 days'—delay hetween the Pacific side of the Panama Canal and the point where a sailing ship strikes the northeast trades, hy reason of calms and the slow progress made while in tow. Allowing that a sailing ship can average 170 statute miles in a day's run, this would add 1,700 miles to the 1,200 miles extra run required *via* Panama, and hence would serve, practically, to make the Tehuantepec route 2,900 miles shorter in the run from New York to San Francisco, and 3,500 miles shorter in the run from New Orleans to San Francisco.

Io the ship railway project a ship is lifted out of the water by means of a submerged pontoon, similar to those in use all over the world; but no such force as that used in hauling a ship up out of the water on a marine railway is required on the ship railway, although, as well known, ships are constantly taken on tbe marine railway without injury. In the Eads' system, however, therc is no necessity for using any force whatever on the ship itself.

It is lifted out of the water in a cradle which rests upon a series of rails; and these heing brought even with the tracks on the dry land, the cradle, in its capacity of a car, is whecled along an almost level railway across the Isthmus of Tehauntepec, aud when it reaches the other side a similar means is employed to float it again. This is the whole project—a combination of the lifting dock in general use, and an improvement upon the marine railway, because the ship is never, as in the latter, required to he off an even keel.

TEe eugravings which appear in this article (which will he concluded in next week's issue) will give a good idea of some of the details of the plans. The cuts originally appeared in the *Scientific American*, and we ohtained them for the PRESS from the Eads' Ship Railway Company, New York, to which we are indehted also for information additioual to that which has been before published.

The pontoon, or floating dock (see Figs. 1 to 4), is of the same general constructioo as those in use all over the world, save in some important modifications rendered necessary to fit it for its especial work. For it is not enough that the vessel should he docked and lifted out of the water, but that it shall he caused to rest upon a cradle in such a manner that its weight shall be equalized fore and aft, and thus enahle the carriage with its load to move easily and safely. This is effected by means of a system of hydraulic rams arranged along an intermediate deck about six feet helow the upper deck of the pontoon (see Fig. 2). The arrangement of the rams is in hoth lateral and longitudinal lines, the former standing a little less than seven feet apart, the one from the other. The area of the combined rams in each lateral line is the same; the area of the one ram under the keel forward or aft is equal to the area of the five or seven rams amidships. They may he connected and made to work in unison, so that the same pressure per square inch of surface of the rams will exist throughout the whole system, or they may be disconnected hy valves, so that a greater pressure may be brought upon the rams in a certain section or on a certain line. It is no part of the duty of these rams to lift the vessel.

They are designed only to resist its weight as it gradually emerges from the basin. They get their power from a hydraulic pump placed on a tower affixed to tbe side of the pontooo, and rising and sinking with it, but of such a hight that, even when the pontoon rests upon the hottom of the dock, it is not entirely submerged. The pontoon itself is directed hy powerful guides, which cause it to descend and emerge from the water always in the same position.

A ship having entered the mouth of the Coatzacoalcos River, on the Atlantic side, and come up to the basin, the carriage with its cradle is run on to the floating dock, then water is let into the compartments of the pontoon, and dock and cradle gradually sink to the bottom. Then the ship is brought in from the exterior basin, and so adjusted as to position that her keel will he immediately over the continuous keel block of the cradle, and her center of gravity over the center of the carriage. The water is then pumped out of the submerged pontoon in the mauner employed in floating dock systems, and it rises gradually, bringing the cradle up under the ship's hull (see Fig. 2). As soon as the keel block of the cradle is close to the ship's keel, the hydraulic pump is called into action, and pushes up the pendeot rods and posts of the supports gently against the vessel, closely following the lines of her hull and the run of the bilge. The pressure upon the rams increases as the vessel emerges from tbe water, but the water pressure under them heing prevented from escaping by the closing of the valves, the ship's weight, when she stands clear of the water, is borne by the rams hy means of the supports.

In the case of a ship weighing 5,000 tons, each of the 50 lines of rams would, of course, be called to sustain a hurden of exactly 100 tons; and these lines heing placed at equal distances the one from the other, it will readily he seen that each unit of the ship's weight is equally distributed. The weight and displacement of the vessel is learned from the pressure gauge on the hydraulic pump.

The vessel being clear of the water, hand wheels or adjusting nuts that move in threads cut in the columns of the supports are run down to the bearings on the girder plates, whereupon the valve is opened and tbe rams withdrawn, leaving the girders to support the weight of the ship. Now, each girder has the same number of wheels, aod as described above, hears its just proportion of weight and no more; hence, each of the multitudes of wheels under the carriage is called upon to hear the same weight. This weight has been calculated to be only from 8 to 9 tons, though the wheels will he tested to 20. One of the many ingenious contrivances in the scheme is the "hydraulic governor," so called, aud hy which the unevenness of the plane of the pontoon when it is rising or falling with its load can he readily corrected. This apparatus is thus described:

Two cylinders are attached to each corner of the dock, one heing upright and the other inverted. Plungers attached to the pontoons move in them. Thc two cylinders on diagonal corners are counected by pipes, and all spaces in the cylinders and pipes are filled solid with water. As the pontoon rises, the water forced out of one cylinder by the ascending plunger is forced into the inverted cylinder on the diagonal corner where the plunger is heing withdrawn. Now, if there is, say 100 tons preponderance on one end of the pontoon, ooe-half this weight, or 50 tons pressure, will be exerted hy each plunger on that end upon the water in its cylinder. This pressure is instantaneously transmitted through the pipes to the water in the top of the upright cylinder on the diagonal corner, which acts with the same amount of pressure as a water plunger upon the metal plunger to hold it down; thus an equilibrium is maintained, and the pontoon compelled to rise and fall perfectly level. It is possible hy aid of a pressure gauge attached to the pipes to ascertain the exact amount of the excess of weight, so that, should this gauge show too great a preponderance, the pontoon must be lowered and the ship placed in a new position.

The pontoon cannot elevate the rails on its deck above what would he a prolongation of the rails ashore, hecause of the heads of the anchor bolts or guiding rods, and these will also prevent any tipping of the pontoon when the ship-burdened cradle is moving off. The carriage with its cradle, which comes up upon the suhmerged deck, is calculated to hold a sbip even more firmly than the launching cradle used at the ship-yards, with its shores and stays. This carriage moves upon six rails, three standard gauge tracks each of four feet eight and one-half inches. Ships themselves are girders, and must of themselves he so, from steru to stern, hecause in the tempestuous seas iu which they are designed to roam, the one part is constantly heing called upon to support the other; now her how projects over a great hillow with no hing under to support it, and again she is poised upon a huge wave, leaving the midship section to support in great measure both the how and the stern, and were she not constructed as a girder fore and aft her back would he broken in the first hig seas she encountered. Comprehending this, the dcsigners of the ship-carriage make its streng h reach its maximum in the cross girders, which are spaced like the lateral lioes of the rams already described; that is to say, seven feet apart and haviug sufficient depth and naterial in their plates to insure an equal deposit of weight upon all the wheels. These latter are double-flanged and are placed close together, each heing hung independently on its own journals, and having its own axle. Under an ordinary railway car the four or six-wheel trucks move together about a center pin, hut in the ship-carriage, which is not designed to move off from an almost straight line, this is not required, and greater strength is ohtained by adhering to the rigid principle, elasticity heing had hy placiog a powerful spring over each wheel. These springs will, as said before, hear a weight of tweuty tons and have a vertical movement of about six inches, while the maximum weight they will ho called upon to hear will not depress them more than three inches, and allow for crossing irregularities without hringiog an undue weight upon the wheels.

There is also a system of supports for the vessel, each having adjustable surfaces hinged to the top of the supports hy a toggle joint, in such a way that they may he made to closely follow every depression and yield easily to every protuberance or bulging. They pierce he girders of the carriage, and are exactly pendent over the hydraulic rams when the carriage is on the pontoon and rests in its proper posi ion. Thus, as will he seen, the ship when crossing the Isthmus rests upon what might be called a cushion, and indeed she will have experienced far rougher treatment, hoth in the Atlantic and Pacific under only ordinary conditions of weather, than that had while in *transitu* hy rail across the isthmus.

In our illustrations, Fig. 1 shows an elevation of the adjusting of the screw standards for supporting the vessel on the pontoon, the details of these standards being given in Fig. 4. A is the standard, having a head plate with universal joint, its top cushioned with rubher or canvas, to prevent damage to the ship; B is an adjusting nut, which, when the rams are down, stops the descent of the jack by contact with the top side of the main girder, C, on which they will rest, D heing the top of the hydraulic jack of the pontoon, the number of these jacks used being better shown in Fig. 3, a perspective of the floating pontoon. E F G, in Fig. 2, show the sectional girders hy which the weight of the vessel is distributed on the jacks. H shows one of the upper pontoon sections. J shows an arrangement in connection with the pump on pumping tower, L, to distrihute the load of the vessel equally on all the jacks. I and K show the arrangement hy which the water is exhausted from the pontoon. On eacb side of the basin there are several rods, on top of which are nuts capahle of holding the poutoon, to prevent its rising ahove the level of the railway when the ship and cradle have heeu taken off. Fig. 5, on page 189, gives a general view of the lifting portion aud railway cradle.

(*Continued next week.*)

The Miners' Appeal.

The Miners' Association, during the last days of the session of the Legislature, presented the following petition, which, however, did no good, as the Cross hill, which was drawn to give them relief, was defeated.

To the Assembly of California:—The last hours of the sessiou of the Legislature for 1885 find the hill introduced into your honorable body to enable the miners to continue their industry legally without injury to any and benefit to all, not yet reported from the committee, and by the aid of the irrigators, defeated io the Senate; and representing, as we do, tbe miners of the State, our sense of duty impels us to make one last appeal for protection and justice at your hands. No question of more vital importance was ever presented to the Legislature of any State in the Union. We come asking for hread for the vast constituency we represent; will you give them a stone? Hear us for our cause; turn not a deaf ear to the supplications of the thousands and tens of thousands whose now happy bomes will he made desolate by non-action on your part. The day has come when the *per diem* of the members of the Lsgislature must stop; hut is there no pay except in dollars? Is not the approval of one's own conscience, the gratitude of men, the smiles of women and the happiness of innocent children sometimes worth more? As those who step somewhat outside the hounds of duty to obstruct and defeat all consideration of these hills will forever receive the condemnation of every true friend of California—so will those who now sacrifice something in the cause of justice receive at the hands of the people the ever welcome plaudit, "Well done, good and faithful servants." Will you adjourn and go to your homes without even hearing the cause of those we represent?

You know that thousands upou thousands of people went upon the bleak and arid mountain sides of the forhidding Sierra Nevadas, and into the depths of the most desolate canyons, in search of the royal metal, gold, because it could not he found elsewhere—and, under what they thought the laws of the State and of the nation, constructed enormous reservoirs to store water; built thousands of miles of canals to divert and carry this water, over the roughest portion of the State, to their mioes; they lived in flimsy huts or in caves, or in the open air, or in tents affording insufficient shelter from the hurning sun of summer and the snows and freezing blasts of winter. They were poorly clad and lived on the coarsest food, not enough, in many instances, to support life while they were digging ditches, building reservoirs, running long tunnels, turning rivers from their beds, and waited for the opening, and developing their mines—out of whicb beautiful homes have heen made and large and prospcrous local communities have been built up—our State created, and the gold furnished and distributed with a lavish hand, even to the extent of the support of our Government in its hour of trial.

These people have demonstrated that California can he made to sustain a nation.

That this way, pointed out by these miners, millions of capital was invested in mining enterprises throughout the State, and wealth in solid gold was created to the extent of 1,500 millions or more of dollars.

But now comes an interpretation of law that these facts and doings of the miners and their diversions of water and its use, are wrong and illegal—that a man who has not lived in the State for a generation, and who happens to own a few acres of land hordering upon one of these streams, has the right to have this stream run past his land undiminished in quantity and unpolluted in quality, and to preserve that right, all mining must cease—the beautiful homes must go to ruin, the prosperous communities must leave and the mining districts must he left untenanted and desolate, except by a few Chinamen. Schools and churches must be closed and the miner and his family must seek a new home.

Is this the judgment of the California Legislature? The people we represent are an intelligent, cultivated, earnest, hard-working, law-abiding people. They are non-producers of everything, except gold, that they eat or wear or consume, and as such are a desirable population for our farmers and manufacturers to find a market among. They wish to proceed by legal methods and deprecate one idea of being driven to resort to other measures to protect their property and all they hold dear.

Hundreds of suits involving the destruction of their property and the absolute ruin of thousands, have heen instituted to compel them to close their mines and shut off the life-giving water, without which they cannot he worked.

Suppose the final order comes, and the officers of the law attempt to do an act that will desolate the country? Will free-born American citizens submit to such a wrong? Would not blood miugle with the waters that flow out over and into the mines? In such a contest would not cowardice itself throw away the scabhard?

These people are willing to pay all damage lawfully awarded to any one on account of the diversion of water, or from their mining operations, hut they ask that no one shall be allowed to deprive them of the use of the water or their mines, or levy tribute on them.

Is it unreasonable that they ask you to fix some mode of procedure for determining what they shall do, how much they shall pay in doing so, to those who claim to he damaged tbrough their opsrations and their use of their water?

Is it unreasonahle that they ask you to fix some rules for distributing this cost among themselves? This is all that the bill introduced into your Honorable Assemhly and defeated in the Senate proposes to do. We ask you to bring it up and give it consideration. So great an interest as that we represent cannot and should not he ignored.

If this measure bas not heen brought forward faster, it has not been the fault of its friends; ueither has it been the fault of those whose very existeuce may depend upon your action.

We have spoken thus far in behalf of our present population; hut we add to this a prayer for the future nf California. We beg that you will not, hy non-action, destroy for years the bright future of our State.

We are credihly informed that the eyes of all the East, as well as of Europe, are upon us in this matter. and that we need not expect any immigration of honest miners to add to our population and wealth, or any investment of either home or foreign capital to develop our well-known and most valuable mineral deposits, unless you enact laws under which mining will he legally possible. Very Respectfully,

THE MINERS' ASSOCIATION.

San Francisco, March 5, 1885.

Miners' Wages in Idaho.

The trouhle hetween the miners and tbe mine owners at Broadford and vicinity, have not yet heen amicably settled, says the *Ketchum Keystone*, but no doubt will he in the course of a few days. Miners or others have the right to refuse to work at prices that don't suit them, hut they have not the right to take possession of the property of others and prevent them from employing whom they please. While we do not advocate the reduction of wages in any hranch of husioess, yet, at the same time, we think men should make the hest of the situation until they can do hetter. If they wish to work at all, it is better to work at $3.50 or even $3, than to remain idle.

Miners' wages are coming down all over the West, and before a twelvemonth has passed, $3 will be the established price for a day's work in mines of the Pacific Slope. The reduction is not made through choice. Mine owners are as much compelled to economise in times of general depression as men are in other branches of business. All mines being worked do not pay. There was never but one Comstock, one Ontario, one Horn Silver, one General Custer, one Consolidated Eureka, one Iron Silver, while there have heen, and are yet, thousands of mines with a history that do not afford a dividend, and many of these even refuse to give hack the money that has been put into them. On the n her hand, many mines, now unproductive, could be made to pay reasonable interest at $3 or $3.50 per day for labor.

The mine owner has but this alternative—make his mine yield something more than expenses or close it down. Matters of this kind should he considered in a cool, common-sense light, and not in a spirit of hatred and revenge. Men should have a hearing of dignity and a spirit of independence. If they are informed hy their employer that $4 cannot he paid any longer, hut that $3.50 can, they should, at least, quietly quit if they are bound to an association that compels them to work for no less than $4, and give others a show who are willing to work for $3.50.

Where, we ask, can the practical miner go

to-day and do better than he can in Wood River? Montana is a $3 to $3.50 country, and more men than there is employment; Nevada, once the banner mining State of the Union, is getting down to $3; Utah, Wyoming and Colorado are still worse. There are no wild-cat or snide companies in the Wood River country. Every miner gets his coin for his labor. He does not take chances on an hour's work. Besides, there is more money in labor here to-day at $3.50 than there was at $4.50 two years ago. Nearly every commodity was then double the price it is now. These things should be considered.

Further, we have been in mining regions and in mines, and with miners for a quarter of a century, and we have observed that this government is big enough and strong enough, and ever ready to protect its citizens in their property rights, and whoever undertakes to unlawfully dispossess another of his rights, and attempts to run his business for him, will get left every time, as they should.

Applies to Other Districts Also.

A correspondent of the *Quincy National*, speaking of Plumas county quartz, says:

"As a recent arrival in your county, I cannot help feeling surprised at the marked apathy displayed by your mining population in respect to that most important branch of their industry, the manipulation of quartz, as it is on that the future prosperity of this district mainly depends. For though rich gravel beds may still exist in this vicinity, the stringent laws lately enacted against hydraulic mining renders it imperative you should turn your attention to quartz, or abandon one of the most promising mining fields on this coast. One would naturally suppose, the success attending the development of the Plumas Eureks, which is evidently a mother lode and extends for a long distance in this direction, would have demonstrated that a little energy alone is required to give this district a more permanent and healthy prosperity than it ever enjoyed in those exciting days when your placer mines were in full bloom, as there is a stability and soundness attached to quartz working seldom found in placer mines, though the latter pursuit is frequently the most exciting. Now, I do not say that any fabulously rich ledges exist in this district, but fully concur with several practical mineralogists who have traversed the belt, in maintaining that the mother lode of the Plumas Eureka, with several other parallel gold bearing veins, extends through this section of the country, and could, with very little expense, be uncovered in several places between this and Johnsville, thus opening an extensive and rich mineral belt which at present lies dormant. This is a matter of importance to the whole of your community, as all must benefit in a greater or less degree by the development of your mines. As a nation the Americans are generally credited with being more energetic and enterprising than our cautious neighbors, the English, and yet I can safely affirm that in no part of Australia, New Zealand or other British gold bearing provinces, would so promising a field as this remain undeveloped. The facilities for prospecting in this district are good, and but little expense would be incurred in fitting out a party of energetic and practical miners, who could in a short time determine whether Quincy is to sink into oblivion or become the business center of an extensive and prosperous mining district.

Mining Excitement at Bishop Creek.—A discovery of quartz, bearing silver, was made on the west side of Owens River valley last week. It is about opposite Bisbop creek and was found by Freeman, the assayer, and Coats, his partner in the find. Some of the rock has been sent here for assay, and it certainly has a very lively appearance. It is white quartz, through which are numerous veins of metal looking like silver, but probably contains a quantity of antimony. The town of Bishop Creek is in a ferment of excitement. On the first receipt of the news every man who could reach the locality of the new discovery went there, leaving business and other cares to that of the women and children. The whole country in the vicinity of the find has been located, and locations are now piling on top of one another. Much of the above information is from a correspondent, and further, he says, that a mining district was being formed and an election of officers was to take place at once. The ledge has been traced for half a mile with good surface indications all the way. Nothing can be told of the depth or amount of ore, as no work has been done. The news has excited many people, besides those living in the valley, each train south bearing a number who are going to take a look at the new diggings.—*Candelaria True Fissure.*

The Commissioner of the General Land Office has transmitted to the Surveyor-General of California for delivery to the party by law entitled thereto, a patent dated February 25, 1885, for the private land claim in California, known as the Rancho Corte de Madera del Presidio, heirs of Juan Read, confirmees. This grant covers an area of 7,845.12 acres.

A fire kindled by Indians among the sage brush near Independence, Inyo county, last Thursday, swept over a large tract of country, and it was with difficulty that a number of houses and hay-stacks were saved from destruction.

Useful Information.

Eighty Years of Usefulness.

There is something encouraging to young mechanics in the fact that a distinguished member of the craft has just completed eighty years of useful life and is still busy. In effort he is a very young man, for he hopes beyond his accomplishments, and believes beyond his possibilities. This old-young man is John Ericsson, the designer of the first monitor—for so he will be remembered in this country and others. And yet he will be considered historically as an inventor of the locomotive, of caloric engine, of a screw for the driving of vessels, and possibly as the originator of a "destroyer" that may add greatly to our national defenses. Possibly his solar engine may also add to his fame; but he will be held in remembrance, by those who share his friendship, as a good man and pleasant friend.

John Ericsson was born in Sweden in 1803, his father being a mining proprietor. He was educated as a civil engineer and subsequently practiced his profession in England. There in 1857 he entered a locomotive in competition with that of George Stephenson.

In 1833 he first brought to public notice his caloric engine. In 1837 he constructed the first practicable propeller vessel, the Francis B. Ogden, and the disfavor with which this was received by the British Admiralty resulted in Captain Ericsson's departure for America in 1839. His record in America began with his first essay in war ship building, the Princeton, which was the first steamship ever built with machinery protected from shot by being placed below the water line. The story of the Monitor, which revolutionized naval architecture, is too well-known to need more than a reference. For the last few years Ericsson's time has been chiefly devoted to the perfection of submarine attack, and his torpedo boat, the Destroyer, is the result of his labors in that direction.

Preserving Wood. Creosoted wood has been found less destructible by fire than the unprepared wood. Recently a building, constructed of pine and spruce in their natural state, was burnt, and nothing was left but the sills, which were made of creosoted pine. They were charred, but they retained their form and a certain amount of strength. Another striking case was that of a derrick forty feet high with a forty-foot boom made of creosoted pine standing on an untreated pine base; the latter was burned to ashes, but the mast and boom, although charred all over, had forty-five feet of their length still good for future use. Creosoted wood can be easily extinguished with water when on fire. Wood can also be preserved from decay by exhausting the air from the pores and filling them with a gutta-percha solution. This process effectually preserves the wood from moisture, water and the action of the sun. The solution is made by mixing two thirds of gutta-percha to one-third of paraffine. This mixture is then heated to liquefy the gutta-percha, when it is readily introduced into the pores of the wood. The gutta-percha hardens the pores when it becomes cool.

The Eyes of Insects.—Many insects have a most wonderful development of eyes. In the common house-fly two small round projections may be seen at the side of the head. These little dull protuberances are not, as many suppose, the eyes. Each projection contains many thousands of eyes, disposed in rows, each one of which is capable of transmitting an impression of outward objects, and by this means the fly can see as well from behind as before, as well above as below, and is, therefore, put on its guard against an attack from any direction. The eyes of a silk-worm, as nearly as can be determined, amount to 6,236, while an ordinary drone fly has not less than 14,000, and the dragon fly puts them all in the shade by being the possessor of not less than 27,000 eyes. It has been practically demonstrated by means of the microscope that each one of these eyes is capable of receiving an independent and distinct impression.

Simple Test for Glucose in Sugar.—The simplest and best test is to place a little of it under the low power of a microscope. Magnifying forty times is quite sufficient, and less will do. Cane sugar under this power is distinctly and beautifully crystalline, and each crystal looks like rock candy. They are clear, bright and beautiful. Glucose, on the other hand, has a dull, opaque appearance, like a lump of tallow. Once seen, it will be easily known ever after.

Artificial Mother-of-Pearl.—Karl Gohmia, of Berne, after a series of experiments extending over several years, has succeeded in producing artificial mother-of-pearl, indistinguishable in every respect from the natural article. It can be moulded in any shape, produced in any color, is impervious to heat and cold, and its price will be much less than that of ordinary mother-of-pearl.

Electrotypes of Woodcuts are now advantageously made of nickel up to one millimeter thick. The advantages over copper are the hardness, toughness, non-liability to oxidation, and its proportionately low price. Although at present such nickel types cost twice as much as copper ones, they will stand ten times the number of impressions and allow the use of colors which would attack copper.

How Wood Carving is Done.—For an original wood carving the sculptor goes to work precisely the same as though he was modeling for stone. He makes his clay studies and changes them as he thinks may suit the surroundings for which they are intended, and then he makes a plaster cast of them. This cast he sends to a wood-carving shop and the carvers go to work on it. A carving machine first comes into play. This machine has a plane full of little knives, which is first placed over the cast and the knives adjusted to the various elevations of the design. Then the plane is taken to the machine, placed over the block of wood and set in motion. In an exceedingly short time the outlines and exact elevations of the cast are "roughed" out and the block is ready for the finisher.

Four hundred and fifteen new one dollar United States notes, from actual tests, are equivalent in weight to one pound avoirdupois, and the number of notes should be the same of any denomination. It is not, however, perfectly reliable, as the paper upon which the notes are printed often varies in thickness to the extent of one hundred notes in a package of one thousand.

Packing Butter in France.—In France butter is packed in bags not more than three inches in diameter for family use, nor more than two inches for restaurants. Each bag holds two pounds. When filled they are tied and packed in brine in tubs or casks which can be headed tight. The cloth used must be quite free from lint, and should be very slightly starched.

For Cleaning old Paint.—Two ounces of soda dissolved in a quart of hot water will make a ready and useful solution for cleaning old painted work preparatory to repainting. This mixture, in the above proportion, should be applied when warm, and the woodwork afterward washed with water to remove all traces of soda.

Illuminating Paper.—A German paper-trade journal says that a water-proof paper which will shine in the dark can be made of 40 parts paper stock, 10 parts phosphorescent powder, 10 parts water, one part gelatine and one part bichromate of potash.

To Destroy the Effect of Acid on Clothes.—Dampen as soon as possible, after exposure to the acid with spirits of ammonia. It will destroy the effects immediately.

The First Sewing Machine.—The first complete sewing machine was patented by Elias Howe, Jr., in 1846.

Migratory birds, when flying by night, are at an elevation of from one to four miles above the earth's surface.

Good Health.

Sleeplessness.

Sleep is a perfectly natural function. It is not a negative act, but a positive process. Herein lies the difference between real sleep and the poison-induced torpor which mimics the state of physiological rest. We ought to be able to sleep at will. Napoleon and many busy men—the late Mr. Wakley, for example—developed the power of self-induced sleep to such an extent as to be able to rest whenever and wherever they pleased, for longer or shorter periods, as the conditions admitted. We have been led to believe that Mr. Gladstone at one time possessed this faculty. If that be so, his recent insomnia must be assumed to have been the result of such intense brain worry as inhibited the control of the will; or there may, of course, be physical causes which render the apparatus of the cerebral blood-supply less manageable by the nerve centers.

In any case, it is much to be deplored that, in the study and treatment of insomnia, the profession generally does not more clearly and constantly keep in memory that what we call sleeplessness is really wakefulness, and that before it is justifiable to resort to the use of stupefying drugs the precise cause of disturbance should be clearly made out. This, of course, takes time, and involves a scientific testing of the relative excitabilities of the sense-organs, central or radial and peripheral. The discovery of the cause, however, affords ample recompense for the trouble of searching for it. With the sphygmograph and a few test appliances, such as Galton's whistle, an optometer, and other instruments, the recognition of the form and cause of sleeplessness can be made in a brief space, and then, and then only we protest, it can be scientifically—*i. e.*, physiologically—treated.—*Lancet.*

A Salt Water Bath at Home.—In order to supply the continent from seashore to center, from the metropolis to the frontier, with sea-water, it is not necessary to barrel or bottle it, nor to build a pipe-line. The most excellent way is to reduce its bulk by evaporation, and when old ocean is dry and clean, pack it away in boxes weighing from one to fifty pounds. Then send it by express or freight to its destination. All the saline properties of the sea are intact, and by adding the proper quantity of water to marine salt a bath is obtained which contains, besides salt (chloride of sodium), the sulphate and chloride of magnesia, the sulphates of lime and soda and traces of the chloride of potassium and iodine.

But while we summon modern skill and enterprise to our service we must remember that the beneficial effect of sea bathing is not a modern or an individual discovery. The salutary results of a plunge into the surf is universally recognized, and its practice instinctive where and when the atmospheric conditions admit of it. Many persons find its influence over the physical and nervous system so healthful that they consider it essential to spend a few weeks or a few days at the seashore, even at great expense or great inconvenience, for they thus hope to lay up a store of health and strength that will last for months. The record of the seaside resorts of our coasts for the past few years shows the great and growing popularity of sea bathing. Modern chemistry analyzing the properties of sea-water declare it tonic and remedial, a corrective of disease and a conservator of health.

How to Remove Dandruff.—Take a piece of gum camphor as large as a chestnut and place it in one pint of alcohol. This camphorizes the alcohol. The mixture may be perfumed to suit the taste. Wet the scalp with this daily. It will stimulate the scalp, promote the growth of the hair and in many instances prevent it from falling out. German women are noted for their luxuriant hair. Once in every two weeks they wash the head thoroughly with a quart of soft water, in which a handful of bran and a little white soap had been dissolved, then the yolk of an egg, slightly beaten, is rubbed into the roots of the hair; this is allowed to remain a few minutes, and then the hair is washed and rinsed carefully in soft water. It is then wiped and dried thoroughly, combed from the forehead and parted with the fingers. After drying apply a little pomatum, made of beef marrow boiled in a quantity of olive oil and slightly perfumed. Do this near the fire in winter or in a very warm room. Almost all curling fluids are mere impositions, but with a weak solution of isinglass a firm and lasting form may be given to the hair. This solution is inoffensive. The hair should be well brushed every day in order to keep it in perfect condition. Always use the best brushes. They are the cheapest in the end. Use the brush very rapidly and for about five minutes. A celebrated beauty said that the hair should receive 100 strokes a day, and they should be applied in three minutes' time. A good and the safest wash for the teeth is pure soft water and the finest quality of castile soap. Apply with a moderately stiff brush morning and evening. The above receipts are worthy of a trial, especially for those who desire beautiful hair.

Sealskins Dangerous to Health.—Dr. J. Solis Cohen, the eminent specialist in throat and chest diseases, said to a reporter of the *Philadelphia Record*, recently, that furs upon garments to be worn about the shoulders and neck are all of them to be avoided. The thoughtless manner in which the garments are thrown back from the shoulders and throat after the body has been unduly heated by them is the chief objection to the furs. They also prevent proper circulation, and as the body in ordinary weather can be kept sufficiently warm with other and lighter garments, the furs should be abandoned. A small fur boa which is thrown about the throat while the wearer is in the open air, and at once thrown aside upon entering the house, is considered a good thing. "The sealskin coats, however, are specially worthy of notice," said the doctor, "because they have become so common. It is entirely too heavy a wrap for this section. If used discreetly, and only in very cold weather, it is unobjectionable; but the trouble is that some of the fair owners of the pretty coats wear them in pretty much all sorts of weather, because they are both fashionable and becoming, and because many ladies can only afford the one garment and must wear it at all times. Thus it is a wrap of everyday use in a climate which does not require so heavy a garment. The result is frequent perspirations suddenly checked. This means cold, consumption, death."

Silk and Wool Underclothing.—An exchange treating upon "wool and silk clothing," says: "An essential point in respect to health, and as a preventive of disease, is to keep warm in the middle line of the front of the body, as well as to sufficiently protect the spinal column, and this we contend can most efficiently be performed by wool or silk underwear. Silk, we think, has the advantage by affording electrical conditions conducive to a strong, regular and equal circulation of the blood to the extremities, as well as to all parts of the body. Experience has demonstrated that silk underclothing will in some cases cure, and in all mitigate, the pains of rheumatism, neuralgia, and nervous diseases of many kinds, while even in febrile diseases it exerts an influence that is very beneficial in giving increased vigor to the patient. Persons wearing silk underclothing are less susceptible to climatic changes, and are more free from colds than even those wearing garments made of wool. Medical science has also shown in numerous instances that silk resists the spread of contagious diseases that are rapidly and alarmingly reproduced wherever plant fiber takes up and carries the offensive odors emanating from the sick chamber."

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

INDIAN DIGGINGS.—Amador *Ledger*, March 14: Mining at this camp has been unusually active this season. The Hale and Baughman claim is being worked with a full force, and is piped with a six-inch nozzle. At the last run the owners cleaned up $3,000, and they expect to realize twice that amount as the result of the present run. The Oxby claim is in splendid gravel, with excellent prospects of a rich yield. It is running full blast. The old Francis Culling's claim is being worked by A. Ball and C. Jenkinson. Under former management the claim was worked at a loss, as they were unable to bottom it. This difficulty has been overcome, and a profitable run is looked for. John Leventon is piping a cross-cut to tap the old claim below the Lawrence ranch. He is in good pay gravel, and is sanguine of success. It is reported that the Plymouth company intend to shut off the water from this section next month, for the purpose of increasing their supply. This will be a sad blow to this region, as there are so many dependent upon these mines for a living.

BUNKER HILL.—At this mine everything is moving along satisfactorily. The 40-stamp mill is kept running to its full capacity, from the 700-foot level, with ore in sight to keep the stamps going for an indefinite period. The contract for sinking the shaft 100 feet deeper will soon be completed, when a new level at 800 feet will be opened up. The ore sent to the mill averages about $7 per ton, exclusive of sulphurets, the sulphurets paying about $60 per ton. We stated a week or two ago that the sulphuret works had closed down, and the sulphurets were being sent to the Drytown reduction works. The latter statement was incorrect. The shutting down was necessitated on account of the supply of wood being exhausted, and the impossibility of hauling at that time. No sulpburets, however, have been sent away for treatment. They are being stored until the works are in shape to start up again. Before starting again it is intended to do some necessary repairs to the oven. In this connection we may state that the Meare's process of chlorination has been abandoned, and the old Platner process readopted. The last run was by the Platner method. While the Meare's process is found to save a higher percentage of gold, the old method is found the handiest for low-grade sulphurets, and is moreover less prejudicial to health.

MISCELLANEOUS.—The Plymouth Con. paid its regular monthly dividend of 50 cents per share, aggregating $50,000 on the 5th instant. We are informed that the big tunnel at Middle Bar has encountered a considerable body of quartz, said to be five feet wide and of paying quality. The extraction of the rich metal from the Mammoth still continues.

SUTTER CREEK.—Mining interests are at a very low ebb here. At the Mahoney operations are postponed, as one of the present owners is expecting to effect a sale of part of the property.

NOTES.—Amador *Sentinel*, March 14: The St. Jullian mill is pounding away. Pay day at the Zeile yesterday. Silver dollars plentiful. The most encouraging reports continue to reach us from the Amador Queen mine. This conviction is wide cast among our citizens that the river country will in a year or so bring Jackson to the front rank of mining towns. W. G. Anderson went below yesterday morning for the purpose of getting track iron and other necessary equipments for the New York mine. We understand that this mine has a large body of ore developed, an assay of which went $39 per ton. It is the intention to put up a mill as soon as the machinery and lumber can be got on the ground, and have it running by the first of June at the latest. Recently Mr. Anderson has been doing considerable ditching for the purpose of availing himself of the water in the creek on his gravel mine. He has now five men or more at work there.

Calaveras.

A NEW MILL.—Calaveras *Chronicle*, March 14: It is reported, on good authority, that a new five-stamp quartz mill is to be erected on the Bryan Quartz mine adjoining the Boston mine. It is said that the machinery is already on the, way and is now at Ione awaiting teams to haul it to its destination. Our Angels correspondent says: The cleanup at the Becktol mine recently was quite satisfactory and encouraging. For the past 14 days the amalgamating was in charge of Thos. Lee, an intelligent and experienced miner, and former resident of Angels. Arrangements have been made to continue his services at the mine.

Del Norte.

CHANNEL FOUND.—Del Norte *Record*, March 14: We are glad to learn that our old friend John Byron, alias Nigger John, has struck another bonanza on Crage's creek. John has been striking it big on this creek for about 20 years, but until now he has somehow been unfortunate. This time he says he has found the channel. He brought in $59 taken from from the mine during a few days previous.

El Dorado.

GUNWOOD.—*Mountain-Democrat*, March 14: Quartz mining, hitherto so much neglected in this part of the county, bids fair to vindicate the judgment of the select few who have never lost faith in the value of our lode mines. The Zentgraf mine, near Wildgoose Flat, is a notable example of what can be done in quartz. Mr. Zentgraf is steadily at work developing and working his mine with the most pleasant results. A recent run of ten days with bis five-stamp mill, produced 101 and 6-20 ounces of gold. He has run the 100-foot level, from the mill, 700 feet on the lode, which averages three feet in width for the entire distance, and the quartz is of an even quality of profitable milling ore. Without the aid of capital, Mr. Zentgraf bas opened and one of the very best mining properties in the State. On the occasion of a recent visit, I found the mine and mill being steadily worked. At Pilot Hill, Mr. J. A. Mendes is steadily and quietly continuing to worked this mine on its own merits, and to-day has open up the Pilot Hill mine. The discovery of some very rich quartz has already rewarded his energy, and he has now every reasonable assurance that he will be amply justified for the considerable outlay he has incurred and the perseverance he has displayed in prospecting this mine. We need a few more men like Mr. Mendes to take hold of our very promising and sadly neglected quartz opportunities with the grand mineral resources we possess. The present inactivity in our mines, and general complaint of dull times is a sad reflection on our lack of energy.

Inyo.

BEVERIDGE.—Inyo *Independent*, March 14: Reports from Straus mine in Bevcridge are very favorable. The ledge is very strong, 4 ft wide, and opening up in a most encouraging way. The ore continues to be fully as rich as where first struck, is all free milling, gold bearing, and beyond question will pay.

A PAYING MINE.—Messrs. Alexander, Kehoe & Barnes shipped 64,335 pounds of ore from the White Hill mine to the Selby Smelting and Lead Co., S. F., from which they received the following: Net value per ton $86; deductions from gross value, 20 per cent loss for lead, and 12½ per cent loss for silver, in smelting, and $20 per ton, expense of working. This mine is in a paying condition, for the simple reason that its owners, instead of letting their picks rust while they wished for capital, went to work in earnest to develop it. There are many others which need only the same treatment to pay equally well.

Mariposa.

THE NORTH SIDE.—Cor. Mariposa *Herald*, March 13: Quartz is all the talk in this part of the county at present. Every old prospector seems to be striking it rich. The Red Cloud mine is panning out big. Several new strikes have been made above Coulterville lately, one of which, if it bolds out for 50 feet, the lucky owners will get $30,000 for, from San Francisco parties. The belt of mineral which lays southwest of Coulterville has been overlooked by all mining experts. People say there is nothing there, but it is a wrong idea. I have followed mining for a long time and have been in camps where there was always one part of the district called barren. You could not get a capitalist to go and look at it; but I have seen these parts turn out the best paying mines in the long run. Take for instance, the big gold mining belt of Bingbam canyon, Utah. It was discovered in '78, though it had been overlooked for 14 years. The best mining men in the country were constantly walking over it. The richest mine on the belt lay idle for years open to relocation, and was located by a man who thought the sulphurets gold. He was right in one sense, for they did carry enough of the filthy lucre to make him independent. He sold three months after for $80,000. The mine is now owned by a company who employ over 300 men. There is 12 mills now on the belt which extends four or five miles on that barren spot which experts pronounced no good. The old saying is, "gold is where you find it." The belt which lays southwest of Coulterville has been overlooked like the Bingham canyon belt. There has not been a thousand dollars worth of work done on any mine there with the exception of Jo. Barrett's mine. A mine where $100,000 was taken out lays idle because so called mining experts don't like the belt. There is the Mignonette mine, worked by Barrett in early days which paid well after hauling the rock 14 miles. It is now owned by John Burns who has worked it for over two years and has made it pay, though he only has an arastra. He has more than 150 tons of quartz on the dump waiting for milling facilities, but what can a poor man do in California? If the mine was in Idaho or Montana it would sell for $50,000 cash down. The Rhin and Baxter mine is the same kind, at present idle for the want of capital. Thus is several other locations which will prove valuable in the near future or I am greatly mistaken. Baxter, one of the owners of the last named mine, took out considerable gold in Mineral Basin, where M. Murray has got several good locations, so you see there is a chance for a boom here soon. All this part wants is capital to make it a paying district.

Modoc.

NEW MACHINERY.—Greenville *Bulletin*, March 11: Messrs. Bidwell & Watson of the Iron Works, are engaged in building a "rubbing" machine ordered by Messrs. Knight & Roseberry of Adin, Modoc county, for their quartz mill at Hayden Hill. This machine has been found to greatly assist the process of amalgamating, a large number of them having been built here for the mills of the Green Mountain Co. and other mines of the district. Their action is to rub and brighten any flakes of rusty gold that may occur, and which would not otherwise be acted upon by the quicksilver.

Mono.

BETTER THAN WISHING.—Inyo *Independent*, March 10: Some miners are always wishing for capitalists to come along and help them develop their mines. Wishing don't develop anything. The miners at Sweetwater, Mono county, do better; one who has been up there says there are about 20 miners in the camp, all working for themselves and making more than wages. The ledges bave about the same dip as those on the Comstock, but carry very little gold. The ore is free milling, and averages $85 per ton in silver. It is packed 8 miles to the mill on mules. There is plenty of wood and water close by, and the miners will soon be able to put up a mill of their own convenient to the camp, which will greatly reduce the cost of milling.

Nevada.

WASHINGTON DISTRICT.—*Transcript*, March 14: All reports from Washington mining district continue to be uniformly encouraging. The continuance of fine weather permits developments to be pushed ahead in all directions, and a big year's work will be done. The ledge at the Yuba is being sunk and drifted on and is daily increasing in size and growing richer as a depth is reached. Ten more stamps will be added to the mill immediately, and it will doubtless be found necessary to make a still further enlargement of the capacity for crushing before the summer is over, as an immense body of fine ore is being uncovered. Mr. Webber, one of the principal stockholders in this property, is interested in other well developed claims in the same vicinity, and the extensive working of them will be begun this season. Good ore is being taken out and in large quantities by the Cornucopia and Secret Treasure Company. The Eagle Bird continues to improve, which is saying a great deal, for old miners who are well acquainted with it regard it as one of the greatest mines in that district, which is equivalent to remarking that there is not a better one in the State for the amount of capital and labor expended on it. Towle Bros. & Co. are rapidly pushing work in extending their lumbering railroad to the summit of the divide near the town of Omega, which will bring the western terminus of it close to Washington district and give direct rail communication with the Central Pacific railroad.

RICH ORE.—The ledge which passes through J. J. Meacbam's houseyard on Piety Hill has been prospected a distance of some 300 feet by several shafts sunk a depth of 30 to 40 feet, and although it is not very thick quite rich ore has been found to exist in various portions of it. Mr. Meacham showed the reporter some specimens Thursday that would yield at the rate of several hundred dollars per ton. The last crushing extracted paid a little over $15 a ton. The chances are good for a permanent and valuable mine being opened there.

Plumas.

GENESEE MINE.—Greenville *Bulletin*, March 11: Arrangements will probably be made early this season to place machinery on this property with which to sink a shaft and further prospect the mine. From the record of its present workings, there is no doubt that this new development will add greatly to its value. It is also probable that the mill will be thoroughly overhauled and repaired, and put in readiness to make the summer's run on the large reserves of ore now exposed.

GREEN MOUNTAIN.—The splendid 60-stamp mill of this company has been running steadily ever since the thorough cleaning, some months ago, of the ditch supplying water for power. The excellent equipment of the property and the general substantial appearance of its surroundings, are worthy of note. Within the mine the work is being pushed with accustomed vigor and the developments, as well as the results from the ore at present being milled, we judge to be very satisfactory. The cheapness with which the ore can be worked, their present great depth below all former workings, and the large amount of yet unexplored ground beyond, point to a brilliant and permanent future for the mine, and the success of the developments already made, marks a new era in the mining industry of the vicinity.

A GOOD STARTER.—The first Reno bound train of the N. & C. R. R. on Monday, brought in $60,000 in bullion from the famous Plumas Eureka mine, Plumas county, Cal.—Reno *Gazette*, March 4th. This is from a mine that a year ago was beginning to be considered pretty well worked out. It is now coming to the front again, and from recent developments is producing better than at any time in its history, and with more encouraging prospects than ever before for future permanency. What has already been accomplished in our own district in the way of deep mining, has demonstrated the permanency of our ore bodies and the day is not far distant when other deep tunnels will be run in our surrounding mountains. We have got the ore in abundance and have proved that it pays to make a substantial outlay to get at it, and the men of capital should be encouraged to take the same view.

DUTCH HILL.—Considerable activity is being manifested in the gravel interests of this locality, and during the coming season there will probably be quite a large number of men employed there and the mines worked on a more extensive scale than for several years past. Very encouraging reports are received from the mine belonging to Baptisto Piazzoni. From a crushing of about three tons of ore—taken without any special selection as to the quality and made with the small Cameron crusher in use at the mine—we learn that nearly $50 was cleaned up. Some parts of the crusher have been sent to the foundry for repairs, but the crushing will be resumed as soon as possible, and a mill placed upon the property as soon as justified.

ANO MINE.—Supt. Standart now has 15 stamps of the Kettle mill fitted up and running on ore from this mine. He is pushing the management with an energy which certainly deserves success, and from what we learn, the results justify their expectations. The Kettle mill bas lain idle for a long time, and being one of the finest mills in the district, it is encouraging to once more see it running. A characteristic and noteworthy feature of the opening of the Ano mine and getting it onto a producing basis, has been the absence of all excitement and "blow" and exaggerated reports. Quietly, but within a comparatively short time, the mine has been equipped, a mill put in order, teams set to work hauling ore, and the property now takes its place among the producing mines of the district.

San Bernardino.

CALICO DISTRICT.—*Print*, March 15: The Burning Moscow is being surveyed. Last week work was resumed on the Josephine. Operations are still in progress in the King mine. A. G. Rhodes continues to develop the Lone Star with good results and chloriders are also doing well. E. Burch & Co. have shipped several carloads of ore from the Blackfoot, a portion of which was taken to the Waterman mill, the returns being more satisfactory than that obtained from other reduction works. A few days will be consumed before the work of putting in five more stamps in the Barber mill is completed. A large quantity of ore is on hand ready for milling. There are about 20 men employed on the Garfield, Occidental, Mammoth and Oriental groups of mines. The Snow Bird is still looking well and may yet develop into a deep-working mine. The Sue is progressing with the usual force of men, and new strikes are frequently being made. Another tunnel is to be run in from the southeast side of the hill. Considerable sinking is being done on the Bismarck, and ore is taken from a depth of about 100 ft. A force of 24 men are at work. The usual force of men are at work on the Cuba and considerable prospecting is being done with favorable results. The surface deposits of ore are not yet exhausted. Sinking is progressing in the most favorable points, and the prospect as they go down is encouraging. Work is still progressing on the Silver Odessa mine with the usual force of men, and from 5 to 10 tons of good ore are taken out daily. Ore is still taken out from numerous points in the mine, and all ore under $100 is left on the dumps for future manipulation. The ore is still found in bunches and pockets, some of which are quite rich.

Shasta.

FRENCH GULCH.—Trinity *Journal*, March 6: A visit to this old Shasta mining town shows all bustle and activity. The town is crowded with prospectors and laborers, and traders say their business is better than any time since 1870. The principal work in the district is being done at the Niagara mine which has been producing about $16,000 per month during the past year with a 12-ton cannon-ball mill. Their new 10-stamp mill is nearly ready for work and will be started up soon. Tom Green has put in a new improved 6-ton cannon-ball and Ira Barnes, the chief engineer, informed us that he had no trouble in grinding 5 tons every 24 hours. It is run with a donkey-engine, and has produced about $20,000 the past year. The Brunswick cannon-ball, on Yankee Gulch, is in operation, run by water, and crushes an average of about 4 tons per day. A rich find is reported on the ridge about one-half mile east of the Brunswick location. The latter company is doing nothing in the mine at present, but expect to resume prospecting as soon as the ore remained on the dump—about 100 tons—is crushed. Several new strikes have of late been made in the district and some of the older mines, notably the Highland, will be opened up again and worked with renewed vigor. The outlook is very bright in that section.

PLACERS AND QUARTZ.—Shasta *Democrat*, Mar. 14: We are informed that W. H. Hall has his new mill at Copper City in successful operation. It is expected that mining capitalists will soon become interested in mining property at French Gulch and Whiskytown. Frank Thompson and John Q. Finch bave struck it rich in gold quartz up the river about six miles. Ore samples of decomposed matter and iron oxides pan out big in free gold. The placer miners in the Buckeye district are just now experiencing no little trouble in getting enough water to clean-up. Several have been compelled to wait for more rain. The Pioneer Company, which set men to work sinking on the Pioneer silver mine on Oregon gulch, last Saturday, at a depth of fifteen feet, struck ore which resembles very much that of the Silver King. Tom Green a few days ago struck another rich quartz ledge in the Deadwood district. He picked up a $200 specimen on the find, and three days afterward refused $10,000 for the claim. Bob Campbell returned last Sunday from a short visit to the new gold mines on Squaw creek. Bob says the district is alive with prospectors and all those who hold claims think they have each a fortune in hand. Lowrey & Brincard a few days ago commenced sinking a shaft on the Silver Queen, the first extension north of the Silver King. At a depth of ten feet they struck pay ore. This makes six prospecting shafts now being sunk in this district for silver, all of which we are told show up good prospects. Fred Grotefend, in company with a couple of miners, late-comers, are at work developing a silver lead the two prospectors discovered on Pete Shearer's land about two weeks ago. We have seen samples of the ore that show brittle silver, some of which assays 150 ounces per ton. N. J. Pehrson, who is sinking for a half interest on Charley Parker's claim near the Silver King, has excellent prospects of developing a fine piece of mining property. Saturday the shaft was down about 20 feet. At the bottom of the shaft the vein is about five feet wide, between fine permanent walls, and the ore compares favorably with the Silver King, which is proving so good. Ellis and Mike Shay of the celebrated Windy Camp mines have been in town for the past few days. They have been for a long time slowly developing the mineral wealth of Windy Camp and are sure to be adequately rewarded for their faith and perseverance. Another discovery of rich gold bearing quartz was made several days ago in the Squaw creek belt, by two prospectors from Redding. Samples of the quartz left at this office prospect equally as well as that from Jack Coonant's claim which recently caused such excitement. The last discovery is high up on a large mountain and three claims have been located. Tucker & Keifer, who are sinking on the Monarch for an interest, have a shaft down about ten feet. At this depth they have very encouraging prospects, the ore not only showing strong indications of silver, but prospects well in gold. The Pioneer Mining Company, composed of five Reddingites, have let a contract to sink a shaft 30 feet in depth on the Pioneer silver mine, the second extension south of the Silver King, and the shaft is now down about 12 feet, the prospect so far being encouraging and satisfactory. S. Hull, proprietor of the Silver Star, the first extension south of the Silver King, also has men at work sinking a shaft with good prospects so far. Indeed, it now looks as if several rich silver mines will be proved to exist on this vein during the summer. That the Silver King is an established mine, there is no question, for Dale & Fife have already in sight $150,000 worth of high grade ore.

SUNNY HILL.—Cor. *Enterprise*, March 14: In this district we find everything booming. The Day & Patton mill is now running at full blast and doing admirable work. The mill which is the Huntington Pulverizer patent, is simple and easy of construction, and is just the thing needed in our vast gold-bearing quartz fields in this part of the State. Messrs. Day & Patton have about 15 men at work—running night and day. They have just completed a first-class assay office and the miners of this region have now golden opportunity of having all their "mysterious" finds assayed at little or no expense. The coming summer will witness a lively time in this portion of Shasta county. Prospecting is rapidly going on and several new finds might be reported. Mr. Spencer will shortly have a fine new mill in operation on his rich and extensive ledge. Signs of improvement are visable on every hand in this section, and everyone appears to be in good spirits and full of bope. Bullychoop in a very short time will be heard from and we may reasonably expect more from that mining field than this immediate section. A few of our miners will go to New River, but not many.

Sierra.

SPECIMENS.—*Mountain-Messenger*, March 14: Some of the richest quartz specimens we have ever seen, were shown us a few days since as coming from the ledge of Gardner & Co., near Poker Flat. One piece was pyrites and gold in about equal proportions. Another was rich in gold with very few sulphurets. York & Johns have put the arastra in Slug canyon in order, and are busy crushing rock from their extension of the Slug canyon ledge. They have developed some very rich quartz, and will have no trouble in keeping the machine supplied as long as water lasts.

Siskiyou.

PICK AND PAN.—Yreka *Union*, March 14: About

No new mining locations have been made in this county within the past three weeks. Mr. J. L. Hipes has claimed for mining purposes a parcel of land on Indian creek, known as the Slide, containing twelve acres. Antone George Simas has located an excellent appearing gold-bearing ledge in the Oro Fino district, where such leads abound. H. A. Morse, Arthur Magee, Haze Hazlitt and Evan Davis have located 20 acres of placer ground in the Cottonwood district, Messrs. George G. Brown and Thomas H. George have located 20 acres of valuable placer ground in the south fork of Salmon river, near to and including the settlement of Brownsville. It is to be known as the Banner mine. Mr. James Donaldson has been placed in charge of the Black Bear mine and property, vice James Gould, resigned. It is given out that operations will commence the middle of next month, but all depends upon the arrival of Lieutenant-Governor Daggett, who may be detained longer than expected. Water is very scarce on Indian creek, and but little work on the mines is being done. The outlook for that district is not at all promising for this season, which is to be very much regretted. Many excellent mines are located in that section; among the number the famous Bonanza, owned by Brown, Bailey, & Bolds, and which created such intense excitement among mining men when first discovered. The owners are well in on the ledge, and are taking out the richest kind ore, gold being fairly matted in some of it. But few are aware that the richest kind of lead mines exist on Boulder creek, near Callahan, Siskiyou county. One mine in particular, we remember having visited a few years ago, will, in time, prove a fortune to its owner. Huge chunks of almost pure lead were to be found at the entrance of the tunnel. We found it difficult to lift a piece of the ore as large as a man's head, which will give an idea of its richness. The discoveries were never worked, as lead commanded such low figures in the market that it would not justify the shipment below on freight wagons, the rates of transportation being too high. When cheaper transportation is afforded by the completion of the C. & O. railroad through the county we expect to class lead among our exports. While the New River mines are occupying our attention we should not lose sight of the rich and important discoveries that have recently been made in this county. For instance, there are the three distinct ledges that were found on the Deadwood divide, a few miles from Yreka, by the Schroder boys last fall. In richness they eclipse anything that has yet been unearthed in the New River district. Soon after they were unearthed the owners could pick up a bucketful of the decomposed rock from any of the ledges and realize, by panning, $25 to the bucket. The prospect was so bright that they at once erected an arastra, whipsawing every foot of lumber used in its construction, on account of the country being so rough and broken, that it was impossible at that time to get lumber to the mines. Their success this winter has been beyond their brightest expectations, having taken out between $8,000 and $10,000, simply by panning decomposed quartz. In addition to this they have taken out many tons of rock which will keep their arastra going for several months, now that an abundance of water is at hand. The unexplored country will soon be visited by a horde of prospectors, bent upon giving the section a thorough investigation before leaving it. It is one of the most inviting fields we know of for exploration, New River not excepted. The weather at present is admissible of the prospecting, very little snow lying on the divide.

Trinity.

DEADWOOD.—We passed through this rich and flourishing quartz mining district last Monday in company with Dr. S. L. Blake, on our way to French Gulch. At the Gibson arastras, Mr. Alex. McGregor was found industriously grinding away with both arastras—one running rock from the Black Bear mine and the other Enterprise ore. The rock in the ore-house, from both mines, looked well. At the Brown Bear mill we found Supt. Watt, and his crew cleaning-up after the regular ten days run, and were informed that the mine looked well and the clean-ups were satisfactory. They are working about 25 men, all of whom do full justice three times a day to the substantial bill of fare provided by Ike Diener at the boarding-house. Jud. and Walter Van Matre are running the reduction works, being at present engaged on a lot of sulphurets from the McDonald mill. Ramm & Kane, lessees of the Diener mine, are taking out some splendid rock and have a good ore body in sight. The McDonald mill has not yet been started up this Spring but will soon be set in motion. The company have a large force at work sinking a shaft on the Barted mine and preparing for the erection of hoisting works. On the return trip Tuesday we met Rube Carmer and Preach Ten Eycke going in with the machinery. George Klein has stopped running his cannon-ball mill temporarily, owing to the scarcity of water. It does good work, grinding four tons per day. The Davidson cannon-ball, at the Vermont mine, is also idle, from a lack of rock, but the work of prospecting in the mine goes on. From other mines good reports were heard, the district now having a permanent reputation.

NEW RIVER.—Cor. Trinity *Journal*, March 14: Our lodes are not very large; some are rich; only a few are developed. Men without money and hunting work are coming to the wrong shop. The mountains around us are not half explored, and I believe there are better mines to be found than have been found. A few sales have been made. G. V. Hely sold the Ridgeway for $10,000. G. Gutzen bonded the Golden Gate for $11,000—got $1,000 down. W. W. Webb who held the bond, rebonded it to a San Francisco company for $20,000, so it is reported. Lots of sales have been made from $20 to $1,000. Mary Blane and Uncle Sam are incorporated and I believe the stock sells well. The Mountain Boomer has taken out several thousand dollars. The Hard Tack has made a good clean-up; Frank Ladd deserves it. There is no doubt the Tough Nut will pay well; Tom Baker is a rustler. C. Huff, Superintendent, and Mr. De Forrest, assayer of the Uncle Sam, need no eulogy; if the gold is there they will have it. Smith Brooks has gone to Eureka and when he gets back the Mary Blane will start up. Brown & Kirby are rigging up their placer mine on Slide creek. The Ridgeway Company are running the Mountain Boomer arastra and expect a ripping clean-up.

N. S. Wescott, U. S. Deputy Surveyor, and Jas. Crossman arrived this week. John Chapman, of Eureka, is here and well pleased with the mines. John Livingston, part owner in the Ridgeway, and Miles Finlan are also there.

E. A. Yocom & Co.'s saw-mill is in full blast. White Rock City is improving. Alex Cœur & Co. are building a large store. Fred. Radellinger and D. S. Stotts are putting up a saloon 40x40. The snow is nearly all gone. No trouble for pack-trains to come from Weaverville or Scott Valley if the trails were fixed a little. C. Baird and Peter's train are expected every day from Scott Valley; freight 3 cents—in summer less. I don't see the need of recommending one trail as better than another; the cheapest way provisions can be brought in and the quickest way passengers can come, will be the roads patronized.

TO NEW RIVER.—Every few days prospectors reach Weaverville and continue on their journey to the New River mines going by way of Rattlesnake. As this has been an unexceptionably open and pleasant Winter, there has been no difficulty whatever in getting through by this route. It is possible that the weather will continue through the Spring months, but more likely that before March ends we shall have a big storm with considerable snow on the mountains. In such event it will not be easy to reach New River from any direction, and those attempting it will have abundant reason for wishing that they had deferred the journey until later in the season. It is well remembered that in years past from 4 to 6 feet of snow has fallen on Trinity mountain in March, and the long continued dry spell which we have had during January and February gives rise to the hope and belief that abundant storm is yet in store, and late Spring rains and snow may be reasonably expected. To those contemplating a visit to New River the advice is given to wait until the middle of April or first of May before making a start.

Tuolumne.

ROCK.—*Union Democrat*, March 14: They are taking out rock from a very rich chute in the Chrysoline mine at Jamestown, and reports say there is plenty more in sight. Messrs. Reed and Richards unearthed a $3,000 pocket at Groveland the fore part of this week, and have a good prospect left. John Morris and Mike Page took a $1,200 pocket out of the old Paul Bauli claim on Bald Mountain Tuesday. Lang and Shaw have completed their new mill on the Kanaka mine near Groveland. The mine is said to be looking well indeed, and we may look for healthy bullion shipments from there shortly. The Lamphire mill has been running steadily for some time, but no cleanups have been made as yet. The mine is reported to present a very favorable appearance, and the ore extracted is of very good quality. The tunnel through Horseshoe Bend at Robinson's Ferry is now in over 400 feet, and is being driven ahead steadily. The Marryatt mine was cleared of water Wednesday. Work in developing the mine will commence next week.

POCKET.—Tuolumne *Independent*, March, 14: Quite a respectable pocket was struck last week, by Messrs. T. R. Reid, C. H. Richards and a Mr. Tarwater, in what was formerly known as the "Blue Lizard Vein," situated on the divide between Groveland and Big Oak Flat. The lowest estimate of the amount, made by parties who saw the gold, is $1,500, and some place it at $3,000.

MESSRS. E. J. RICHARDS, Thomas Richards and J. Pereira, will shortly open an old mine, of former bonanza fame, on Bald Mountain, with the hope of unearthing the remains of the unexcavated treasure.

NEVADA.

Washoe District.

HALE AND NORCROSS.—Virginia *Enterprise*, March 13: Work is being pushed at the above mine, and the managers intend to find an ore body if there is one to be found. On the 2900 level the north drift has been advanced 35 ft during the past week. On the 3000 they are driving a north lateral, just skimming the ledge, and are in a fine, heavy formation. They will crosscut after advancing further.

OPHIR.—On the 500 level have been engaged in cutting a drain and timbering. The drift which is being run north from the west drift on this level is a joint Mexican and Union Consolidated drift.

OVERMAN.—Two shifts have been put to work in the Overman mine. The old Lambert tunnel has been cleaned out, and will be driven in to strike the croppings on a level with the railroad track.

CROWN POINT AND BELCHER.—At the Belcher and Crown Point the usual amount of low-grade ore is being extracted from the old upper levels and sent to the Carson river mills.

C. AND C. SHAFT.—Ore is being extracted from the 1200 level under the Jones contract, and is shipped to the Eureka mill.

SAVAGE.—Nothing of importance is being done in the Savage, but they are waiting for the result in Norcross.

GOULD AND CURRY.—The usual work is being done, but nothing of importance has occurred during the week.

CHOLLAR.—They are running a drift in west on the 2800 level, and are in good looking ground.

SIERRA NEVADA.—Work of repairing machinery, etc., is progressing favorably.

BEST AND BELCHER.—They are pushing forward the north drift on the 1000 level.

Columbus District.

MOUNT DIABLO.—Candelaria *True Fissure*, March 14: The west drift on the sixth level is now in 169 ft. The south crosscut has been stopped, after reaching a length of 50 ft, and a north crosscut has been started 160 ft from the incline. The west drift on the fifth level shows a little low grade ore, while the stope above this drift is giving some $50. The intermediate stope, between the fourth and fifth levels and near winze No. 2, is yielding some $50 ore from a bunch that looks promising. The intermediate stope, between the third and fourth levels and east of the shaft, is producing some $100 from a narrow ledge. There are two stopes above the west drift on the fifth level, both of which are yielding some $70 ore. The stope west of the shaft, between the second and third levels, is not looking so well. The second level is giving a little $80 ore from three small stopes. The workings above the second level show about the same. A bullion shipment of $11,866.91 was made on the 8th instant. This was the final shipment on February account, the total amount being $38,690.72 assay value.

Mount Cory District.

CORYVILLE CROPPINGS.—Walker Lake *Bulletin*, March 14: The North Star continues to show rich ore. Henry Taylor expects to strike the ledge with his tunnel in about 30 ft. The Mount Cory continues to improve and everything is going smoothly. A fine ledge of porphyry and quartz has been struck in the Snow Bird. It assays well. Henry Livingston is working the Silver Brick tunnel, which is a promising property. Prospecting is still carried on vigorously. Al. and Lew Finney, and Chris. Anderson have made several locations.

Tuscarora District.

NORTH BELLE ISLE.—*Times-Review*, March 13: Drift north, on the 150-ft level, was extended 24 ft the past week. The same formation continues.

INDEPENDENCE.—South drift, 400-ft level, has been extended 14 ft; total length, 1091 ft.

BELLE ISLE.—Some good ore is being extracted from the west vein above the 250 ft level.

NAVAJO.—During the past week, have driven 45 ft on the 650-ft level, making the extreme length of the crosscut east 372 ft, and the drift south 51 ft. Winze on the 350-ft level has gained a depth of 85½ ft; progress the last week, 18½ ft. South drift, on the east lateral vein, has been extended 4 ft, showing an improvement. No material change to note at any point.

ARIZONA.

VULTURE TAILINGS.—*Sunshine and Silver*, March 14: Lyman Elmore, a New York lawyer, formerly superintendent of the Mount View Mining Co. at Pinal, came to the Territory a few weeks ago as attorney for the Vulture mining company, in which corporation he is now, a large owner. He is again at the Vulture and proposes to work the tailings of that mine by a new chlorination process, of which he is said to be the originator.

MOHAVE CAMPS.—Mohave *Miner*, March 15: Frank Hamilton and the Oliver Bros. have about completed a 250-foot tunnel on the Mariposa mine at Wallapai mountain. The tunnel has been run on the ledge and considerable low-grade ore has been extracted in running it. Messrs. Ewing and Goshorn of the Altata mine have received returns from their last carload of ore, which was sent to Pueblo about three weeks ago. The car contained just ten tons and five pounds, which assayed 78 ounces in silver to the ton with 17 4-10 per cent copper. Another carload of this ore is already on the way to Kingman. Jack White and Dave Parkes are running a tunnel on the Tiger mine, in Maynard district, which is an extension of the well-known Antelope mine. They have just tapped a 65-foot shaft. Messrs. Woods and Tyrrell are taking out some good paying ore from their claims near the old sawmill at Wallapai mountain. The shipment of ore from the Infallible mine at Stockton hill for the month of February amounted to 85 tons, which was sold to the Kingman sampling works, and sampled 53 ounces in silver and 30 per cent lead to the ton. The shipment for this month will be much larger. We learn from Mr. John Barry, who has just arrived from Prescott, that mining matters are at a standstill in Yavapai county. Contrast this with the fact that we are now shipping from 300 to 400 tons of ore per month from Kingman alone and this is our dullest season here. The Hackberry mill has stopped running on tailings and will shortly work up a lot of custom ore which has accumulated at the mill. Supervisor Raymond has a couple of men at work on the Hibernia mine in Cedar district. They recently sent up a small lot of ore, weighing 1,800 pounds, which netted $430 at the sampling works. Mr. Raymond will leave for the mine in a few days for the purpose of shipping up about 100 tons of ore which is now on the dump, and which he says will assay 100 ounces silver to the ton and 60 per cent lead. The ore has to be packed 13 miles from the mine to the wagon road.

CLEANUP.—Arizona *Miner*, March 14: A cleanup, valued at $1,108, was yesterday made at the Lynx creek placers owned by Governor Tritle and Frank and Oakes Murphy, after a run of 55 hours. This is but a fair example of the richness of the placer claims of northern Arizona and but a slight indication of what wealth could be wrung from their bosoms were a sufficient supply of water always available.

IDAHO.

CŒUR D'ALENE.—Jacksonville *Times*, March 11: H. King and A. L. Rigger passed through here this week, en route to California from the Cœur d'Alene mines. They expect to return to the latter section the forepart of the coming summer, before which time very little work can be done. Both of these gentlemen speak favorably of that camp, and say that the mines are gradually getting better. A large amount of gold was taken out there last season, which will increase as fast as these diggings are opened, there being no doubt of their richness. There is a great deal of snow on the ground at present, which will not begin to disappear before several weeks.

THE BLACKHORSE MINING COMPANY.—Ketchum *Keystone*, March 12: The owners of the Blackhorse mining property, 16 miles up Warm Springs creek from Ketchum, are making preparations to work it on an extensive scale this season. The mine is situated on Boyle Mountain, near the Ontario group, and was among the first discoveries of this district. The Blackhorse has yielded much ore for several years past, and there is a fine showing of mineral in the mine now. On Wednesday evening, Messrs. Jack Delaney, Dan Martin, Jim McKarrick and Leo Gottlieb went up to the mine to ascertain the condition of the road, depth of snow, etc. Delaney, McKarrick and Martin remained at the mine. It is believed that horses can get that far up Warm Springs creek by the middle of March, if the present favorable weather continues.

VIENNA NOTES.—Everything is moving along smoothly in the Vienna and Sawtooth districts. James Moore has 8 men at work on his new mine on South Boise, a couple of miles from Vienna mine. The ore is very rich. Castro & White have made a good strike on the Elcy claim, near the Nellie. There appears to be a considerable ledge of the ore, carrying ruby and sulphurets, some of which assays 250 to 400 ounces silver. The Solace is looking remarkably well, and seems to hold its own as to strength and wealth. The Vienna mill will be running again in a few days. The mine has nearly its full quota of men. All who have gone up there to work on the $3.50 level have found employment. The outlook for the Vienna camp is bright, and those who are conversant with the development of the different mines in Vienna and vicinity, believe that the Vienna camp will be one of the most permanent and one of the best in the Territory.

THE STAR MINE.—Wood River *Times*, March 11: The Star mine, in Star gulch, is showing up well, the ore recently struck improving as drifted upon. The force at work is now taking out more than enough to pay expenses—something which has not been done for years in that mine.

MONTANA.

BLUE BIRD.—Butte *Miner*, March 11: In the shaft of the Blue Bird a body of free milling ore has been encountered and cross-cut, so far, 14 feet and the south or hanging wall not yet encountered. Sinking is still going on. On the dump of both shafts, 4,000 tons of good ore is now piled up and about 600 tons lays upon the tunnel dump. It is hard to tell what Mr. Fleming, a half owner and present superintendent of the Blue Bird will do, but it is surmised he will erect a mill during the coming season.

THE MARIA.—Joe Dafft and his partners in the lease of this valuable mine have just struck a body of 300-ounce ore. Since our last report the lessees have sunk about 50 feet and cross-cut north about 20 or 30 feet where they encountered the rich body of pink manganese and brittle silver ore found in the ore tank at the 75-foot level. The body struck below is the same vein and has widened from 22 inches to four feet. A new strike is also reported in a mine close to the Left Bower. The vein is four feet wide and the entire amount goes 300 ounces. Full particulars will be published in a few days. The Montana Copper Company started up several more calciners yesterday. The entire works will undoubtedly be in full blast inside of four weeks. During the history of Butte as a quartz mining camp there has never been as much winter prospecting as has been going on this season.

OREGON.

IRON ORE.—*Oregonian*, March 12: There was received here yesterday several specimens of magnetic iron ore from the Gasfield mine in Jackson county. The mine is located at Gold Hill station, on the O. & C. road, very close to the railroad track. Assays show that the ore contains 63 per cent and it richness may be understood when it is stated that 72 per cent is the highest known. Some specimens have been presented to the Oregon Board of Immigration, and some will be sent to New Orleans by Mr. C. W. Burrage, who is part owner in the mine.

SHORT SEASON.—Jacksonville *Times*, March 11: The mining season will be rather short, but still much better than several past. Water is getting light and most of the miners have commenced cleaning up. Wimer & Sons and Deselles & Connell of Waldo precinct are running day and night and will no doubt make a big cleanup. Simmons, Ennis & Co.'s mining enterprise near Waldo is progressing favorably. They expect to get their mine opened during the ensuing year. Many of the miners of Josephine county will soon be compelled to shut down, unless timely rains should come to their relief. Water is getting light there also. John A. Horn has discovered a promising quartz ledge on Applegate, in the vicinity of Ed. Hendrick's place. He showed us some specimens which contained considerable gold. The Enterprise mining Co. of this place has let a contract to an old California miner named Knapp to finish their shaft on Fir street. It is proposed to sink down 50 feet in all.

UTAH.

REVIEW.—Salt Lake *Tribune*, March 11: The week has been one of abnormally splendid weather, save one day of storm—Wednesday. The other days for a fortnight have been more like sunny mid-May days. The receipts of bullion and ore in Salt Lake City for the week ending March 11th, inclusive, were extremely light, being of bullion $39,998 36; of ore, $8,640.56, a total of $48,638.92. For the previous week the receipts were $66,669.66 of bullion and $18,257.87 of ore. The new Hanauer smelter started up on the 11th, after a suspension of two months, caused by the burning of the old works. The new smelter is of increased capacity, and its operation will have a decidedly favorable effect on the bullion output of the Territory. The Ontario shipped during the week 38 bars of bullion, assaying $27,489.36, bringing the product for the present year up to $305,594.73. The regular monthly dividend of 50 cents a share, or $75,000, continue without a break. The Horn Silver continues virtually idle, making no shipments of bullion. The Silver Reef country yielded during the week 8 silver bars, $4,560, of which the Christy sent up one, $1,460, and the Stormont two bars, $3,100. Jack Gilmer brought down a gold brick from the Kentuck mine below Salmon City valued at $4,000. The product of the Germania smelter for the week was two cars of bullion, $3,055. The ore receipts were $5,500 worth from the Crescent, $1,000 from the Eureka and $2,140.56 Wood River ore. A strike of 6 ft of carbonate ore has been made in the west ground of the Ashland mine in Bingham. The Ashland is near the old Neptune mine and is the property of George Hearst & Co., but is being worked under a lease to Bemis & Cree. Deignan & Co. have struck 3 or 4 ft of carbonate ore in their new tunnel on the Ten-Forty mine in Bingham. Work on the Nast mine is progressing favorably, and all the prospects in and about Car and Muddy Forks in the Old Reliable camp are said to be looking well. The snow in the Park, Bingham and Ophir is rapidly disappearing. The Vallejo Mining Company, whose works were destroyed by the late snowslide in Alta, has sent men up to the mine to commence the work of repair. A number of mining properties in Ophir have been released by the owners to parties who will go to work on them.

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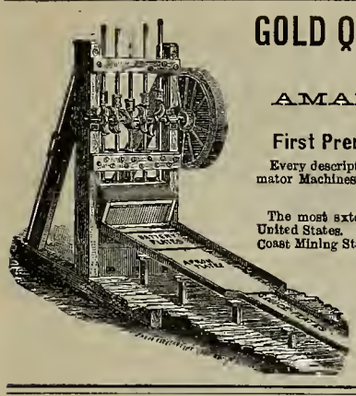

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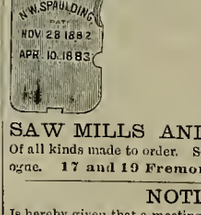

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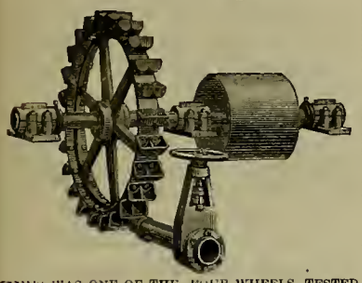

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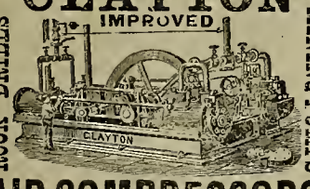

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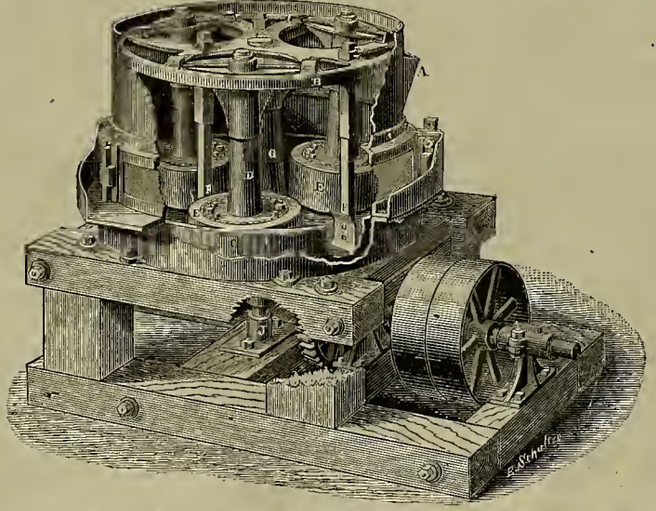

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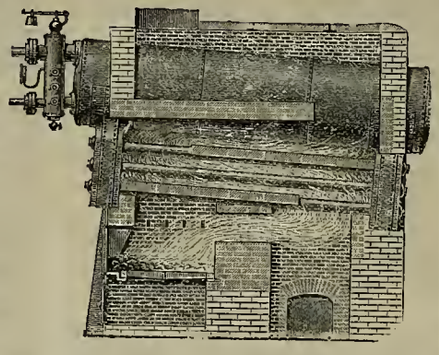

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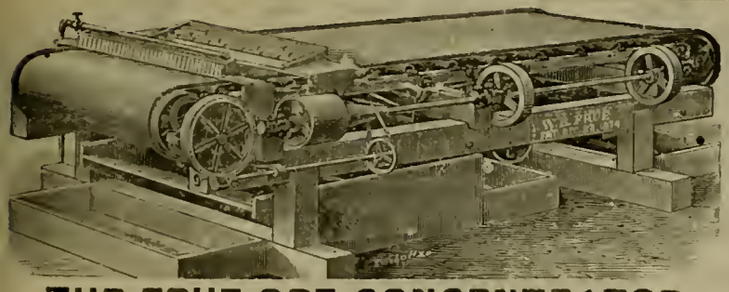

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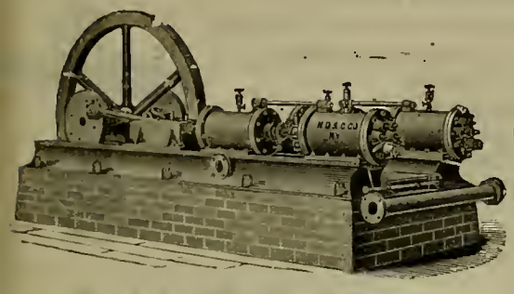

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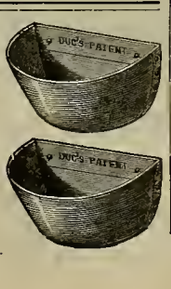

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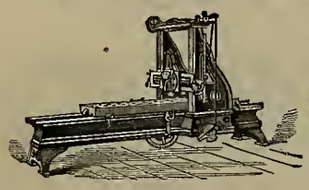

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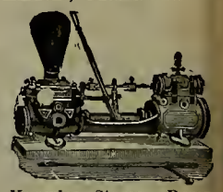

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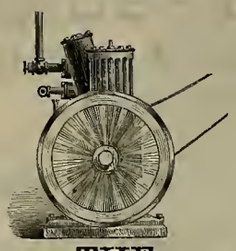

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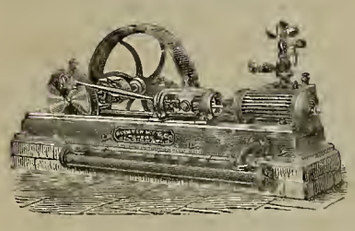

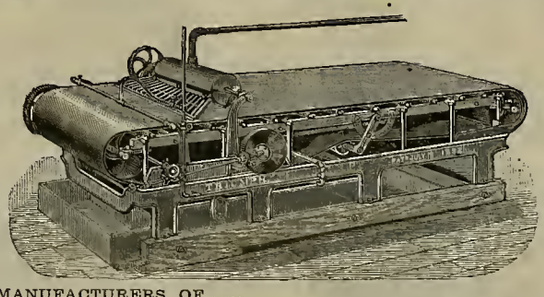

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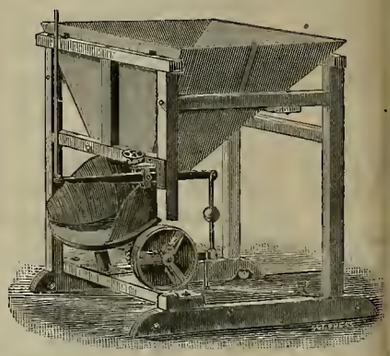

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, MARCH 28, 1885.

VOLUME XLXX
Number 13.

The Interoceanic Ship Railway.

Continued from Last Issue.

As stated in the article in last week's PRESS, the road is designed to be almost exactly straight, since there will be no curves having a radius of less than 20 miles, for the carriage is

toon will be firmly grounded upon the circular bearers of the basin, when the carriage is run upon it, by the admission of water. This is pumped out by a powerful centrifugual pump, the water being drawn through the cylindrical pivot of the pontoon, which is hollow, and discharged into the basin. When the pontoon

over the Isthmian railway will not differ from those in ordinary use, except that they will have about twice the traction power of the most powerful locomotives that run on ordinary railroads. The big freight engines of the day have no difficulty, as we know, in drawing freight trains of a total of 1,500 tons; and as

of 5,000,000 tons in 1888 for any passage across the Isthmus. Four dollars the ton would be but a moderate charge—the Panama Railroad demands $15 a ton. This would give $20,000,000 as gross receipts. Now, it has been estimated that 40 per cent of this would pay all working expenses, thus leaving $12,000,000 all

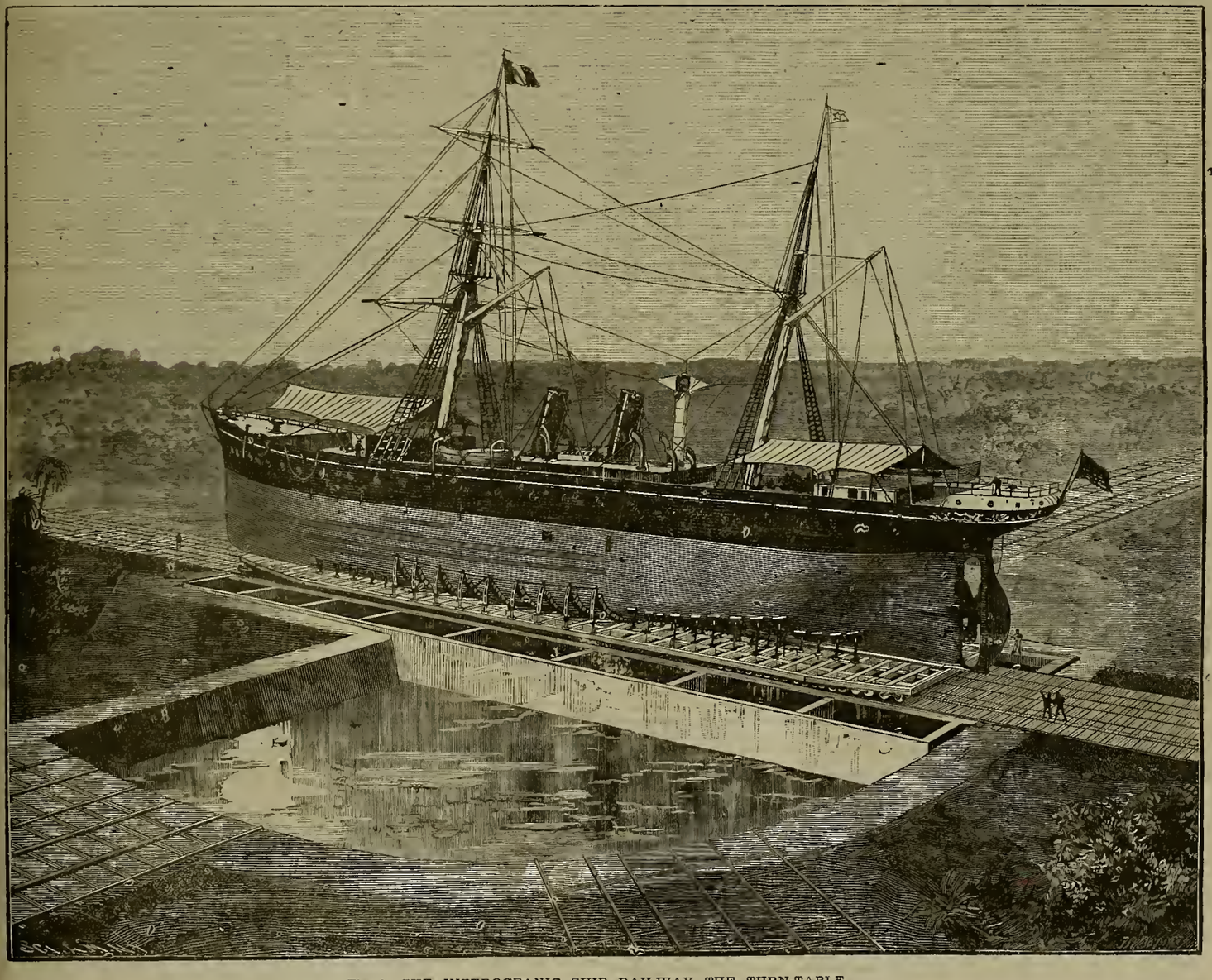

Fig. 1.—THE INTEROCEANIC SHIP RAILWAY—THE TURN-TABLE.

400 feet long, and rests upon wheels which, as already explained, are not set on trucks swinging to a common center. There are only five places in the whole line where it is necessary to deviate from a straight line, and at each of these places a floating turn-table will be built. Fig. 1 on this page gives a view of the floating turn-table, and Figs. 2–3, on page 205, are also illustrations of the turn-table system, which are self-explanatory. These turn-tables in design resemble pontoons, for they rest upon water, and will be strong enough to receive the carriage and its burden. The turn-table pon-

has been made sufficiently buoyant to be turned easily upon its pivot by steam power, the ship carriage is then quickly pointed in its new direction. The valves then permit the water to enter once more, and the pontoon turn-table again rests on its bearings. These turn-tables may be made to serve another purpose. By their means a ship can be run off on a siding, so to speak, where she can be scraped, painted, coppered, calked, or otherwise repaired without removal from her cradle, and thus be saved the heavy expense of going on a dry dock.

The locomotives for hauling the ship carriage

the ship carriage moves along three tracks it would be easy, if such a course were necessary, to place three locomotives in front of it and three behind. The time estimated for crossing from ocean to ocean is only 16 hours. The engraving (Fig. 4) on page 206 shows the method by which a steamship is to be carried over the railway.

The cost of the ship railway as computed by expert engineers will be about fifty million dollars ($50,000,000).

A careful estimate has shown that it would not be unreasonable to look for a gross tonnage

net profit, or 12 per cent on a capitalization of $100,000,000.

The Tehauntepec Ship Railway is a private enterprise that does not ask a dollar from the Government, and there will be little trouble in its construction, if the Government does not by legislation, or by committing itself to the Nicaragua canal scheme, injure its prospects and defeat its aim, which is to furnish a cheap, rapid and safe passage for ships across that narrow strip of land, which heretofore has proved an effectual barrier to aspiring canal builders.

The company supporting Mr. Eads and which

owns the concession granted by Mexico, and is composed of eome of the most wealtby and influential men in Pittsburg, St. Louis, New Orleans and other cities. They are thoroughly in earnest, and determined to build the ehip railway.

It is by far the shortest dis'ance by water between our Eastern and Western ports. It is a direct and necessary supplement to tbe Mississipi river, and is virtually its commercial extension into the Pacific Ocean.

While the benefits are iucalculable to the Mississippi valley and the Atlautic por s, and in fact to the whole of our country lying east of tbe Rocky mountains, the greatest and most direct benefits are those to be reached by our whole Pacific Coast. There is no doubt that the gradual decrease in ocean rates for freight has worked to the advantege of our Pacific coast, as the decrease in rail and ocean freights has been of immense advantage to the vast area lying west of tbe Mississippi river, even to the base of the Rocky mountains. Tbe cheapening of traneportation of agricultural products has changed this wilderness into a garden; but on the Pacific Coast, thougbhere are there, great natural advantages, no relief adequate to our wants has yet been devised. Railroade, several in number, bave been extended east and west and connected us with the Atlantic Coaet, but still we cannot reach Europe with our heavy products except by a voyage of about sixteen thousand miles. We bave a climate and a eoil the most favorable in tbe world for cereal productions; we can raise them as cheaply as any country—cheaper tban any other part of the United States; but not being able to reacb the world's markets except by a long and expensive voyage, we cannot compete with India and Australia sioce the opening of the Suez canal, and the wonderful development of those countries by the money and enterprise of Eog land. India, especially, ie crowding us out of the European markets. The Tehuantepec Sbip Railway ought to re-establieb our eupremacy in the wheat trade and wheat production. We can then compete with any country, for we will he brought two monthe nearer the European markets. It has been stated by experts on this suhject, that the successful inauguration and operation of tbe ship railway, will double our cereal productions within three years. But this is not all. It will bring us into more direct and intimate relations, both in manufactures and commerce with our own country from the Rio Grande to Maine. Tbe heavy and slow freights especially, tbat it does not pay to baul over the transcontinental railways, will then, by a quick voyage, be placed at Galveston, New Orleans, Baltimore, Philadelphia and New York and Boston for tbe use of the immense population tributary to these ports.

It is generally conceded in comparing land and water routes, that four miles of water tranportation on the ocean is equivalent in cost to one mile of rail transportatiou. See how this will figure out. The distance from San Francisco to New York hy the Central and Union Pacific Railways is 3,340 miles; by tbe Tehauntepec All-Water Route, 4,905 miles. By the above rule, the former is equivalent to 13,360 miles of water transportation. The distance from Sau Francisco to New Orleans is about 2,400 miles by rail and 3,576 by water, the former heing equivalent to 9,600 miles of water transportation. This gives the ship railway route an immense advantage over any present routee by rail, and, ae has been previouely seen, over any present water routes. And, from the distancee given in thie article, it aleo hae an advantage over any otber projected inter-oceauic route by meane of a canal.

As Commodore Schufeldt etated in 1871, in an official report of his survey of the Isthmue of Tehuantepec: Each istbmus riees into importance as it liee nearer to the center of the American commercial interests. Any intrineic value of this eminently national work ought to be based upon the inverec ratio of the dietance from that center.

An all-water route by way of Tehuantepec connecte the east and weet coast linee of the United Statee aud Mexico, and ae it were, rendere our own Territory circumnavigable.

Again, tbe conditions that we have given in reference to tbe winds and currents are very important to American commerce especially. It has been stated tbat sailing veesels are giving way rapidly to steamshipe; but from the late report of Mr. Jarvis Patten, tbe United Statee Commissioner of Navigation, we are diepoeed to helieve that the eailing ship etill holds ite own. For he gives as the total number of sea-going sailing shipe owned by citizens of the United Statee, 6114, with a tonnage of 2,099,218; while there are but 422 eteamships, with a tonnage of 601,186.

Another very important statement made by him is this:

That we in thie country, with our excellent woods, which can be obtained at reasonable pricee, can build sailing shipe at from $50 to $55 per ton; but that it costs us to build iron ehipe from $65 to $75 per ton. On the other hand, it coste England to build wooden sailing ships $75 to $80 per ton; but they can build iron ships at from $50 to $60 per ton.

It is therefore very important for our American commerce and for our merchant marine that tbe interoceanic route ehould he located where it can be ueed to advantage by our sailing vessels. The importance of this will be appreciated by every commercial man along the Atlantic and Pacific Coaets, for we are still building these fine wooden eailing ebipe for the San Francisco trade and for other sea-going business.

Again, if thie country desired to control the interoceanic route, and to be able to defend it, let it adopt a route that is capable of defense. At Tehuantepec, with a favorable treaty with the Government of Mexico, and by meane of railway lines that are extended and are extending from the United States to the Mexican capital, and beyond even to Tehuantepec by American citizens, a land force of 100,000 men could be quickly transported from tbe Pacific Coast, Mississippi valley and the Atlantic Coast to meet an invading force.

The Gulf of Mexico, if we have a navy that can do any defensive work, can be easily protected, as the only two outlete to it from the ocean are at the Florida Straits and between Yucatan and Cuba.

This route therefore is vastly superior to any other as a strategic point. Mexico ie a sister republic, hound to us witb ties that are growing etronger and stronger with every dollar of American money that is spent on her soil in building railroads and other constructions for the development of that country. She bas a population of 10,000,000. Wben free from tbe harassing complications which invasions of her soil and overturning of ber legitimate governments have brought upon her, she will be a strong republic, well advanced in agricultural, industrial and commercial prospects, and enabled to be an adequate ally of the United States.

There are already four main longitudinal trunk linee of railroad building, and in tbe course of construction from tbe American border.

Another immense advantage to the whole Pacific Coast by the construction of the sbip railway will be tbe impetus it will give to immigration from European countries. We need, especially for the increased cultivation of our soil that tbe ship railway will bring about, tbese hardy agricultural immigrants, who now do not reacb us, on account of the great expense of transportation over the transcontinental railroads. With our country filled up with these industrious people, who so easily will become a part of our body politic, we can then relegate to their own country the unassimilating Chinese population tbat have infested our coast.

Now that tbe Congress of the United States has refused to ratify the Nicaraugua canal treaty, and there are sucb grave douhts in regard to the completion of the Panama canal, we must rely upon the Tebauntepec Ship Railway as the eolution of this great problem of transportation so directly and essentially effecting our prosperity.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Arizona.

Mojave County Mining Districts.

[From our Traveling Correspondent.]

The surface indications of the many districts of Mojave county indicate the existence of great wealth. Gold and silver ores, free-milling and smelting, abound in numerous formations. Nowhere in tbe Territory, or on the coast for tbat matter, do the indicatione juetify tbe outlay of capital or ehow the neglect of legitimate mining as this rich and undeveloped county. Mismanagement of capital and extravagant farmer or commercial "mining euperintendents," who epent the money given them for development for wine, women and tbrasbing machines, contrators or mille and macbinery necessary for a mine long before they had done even enough development to uncover mineral, or had learned the treatment required for their oree, has hurt Mojave'e reputation away from home.

High Priced Prospects.

Tbe greateet drawback to tbie, ae well as any other district, ie tbe ueual high-priced miner. Nearly every good-looking prospect in the county is owned by a poor miner, and not one in ten would sell their prospect at anytbing near its actual value. Tbis and a deeire to have low rates on ore, a home emelter and eomebody to take out their ores, appeare to bave been the leading characteristics of miners of this district in tbe past. Twenty thoueand dollare expended in Mojave county on a good prospect, in a eyetematic and bueineee-like manner, would develop more ground and produce more bullion than four timee that amount expended by a few hundred men in the happy-go-lucky way of the chloriders and prospectors of the county.

The Ores and Markets.

The mineralized rocke of the district are gold, lead and argentiferous. Veins, ledgee, depoeits and fissuree are claimed as ore producing; tbe ores being both free-milling and smelting. Miners can eell their ores at Kingman etation at 90 per cent of their assay value. The working chargee on the same bring $30 per ton. Sampling charges $5 per ton. The basie of settlement for oree ie made on the New York quotations of eilver and upon the reeult of the scorifioation assay, which is the standard baeie of the Eaetern market. The Colorado and Eaetern markets get most of the ore ehipments of this district. Tbe following prices will sbow what ores bring at Kingman.

Ounces per ton.....	150	Price per ton.....	$113.10
" "	200	" "	160.80
" "	250	" "	208.50
" "	300	" "	256.20
" "	500	" "	447.00

Tbe freight and treatment on ores shipped to Pueblo and Denver is $26.25 per ton. Nothing less than $50 ore will pay to handle thus. Several cars per month are sbipped to Colorado. There is talk of ex-Governor J. B. Grant, of Colorado, building a emelter at Albuquerque, New Mexico. If this is done and low rates are given by the A. & P. people, there will be a boom in the mining interests of all the districts tributary to tbe line of tbe road, and immense dumps of low grade ores that cannot now be handled will pay handsomely for ebipment.

Mining Districte.

Soutb of the line of the A. &. P., 10 miles from Kingman, is the Maynard district. The American Flag, tbe leading mine, is quite extensively developed; the ore is sulpheret and chloride and runs on an average about 100 oz. per ton. Tbe cost of packing and freighting ore to Kingman is $10 per ton.

Ceader valley, some 30 miles further south, boaste of producing some wonderfully rich ore. A few days since 10 sacks of ore weighiug 1,000 pounds was brought to Kingman from tbe Hibernia mine and eold for $250. Water and wood are not very scarce in these districts. Access to some of the minee is eomewbat difficult, and jacks are used to pack ore to the wagon roads, tbue making it more expensive to freigbt the ores to market. Work will be carried on extensively in tbis dietrict during the coming summer.

North of tbe railroad are a number of districts more or less rich iu the making of good mines. Stockton Hill, some 10 miles from Kingman, is attracting attention hy recent rich strikes in galena, wire, and ruby silver deposits that run all the way from 53 ozs. silver and 30 per cent lead to tbe pure etuff.

Mineral Park is a "has been" camp of much notoriety, and has yet untold and undiscovered wealth that only requires capital to expose. Very little is being done in or about the camp. It is tbe county eeat and its inhabitants are not many more tban are needed to run the affairs of the county and the mercantile and irrigation (saloons) bueiness of the place.

Gold Basin, Sau Francisco, Lost Basin and a number of other quartz gold-bearing districts are adjacent to the Park, and there has been some fine prospects found of late, and a number of stamp mills will be put up this summer. Tbe ores run from $20 to $200 per ton.

Sluicings.

The Tigress, at Stockton Hill, is shipping ore to Kingman.

John Mackenzie, the popular ex-County Clerk, has a bonanza in Indian Boy mine, at Stockton Hill. Their recent find of wire silver beats anything of tbe kind in the county.

Deputy Sheriff Keuncer and others have a fine gold mine in tbe San Francieco district.

Postmaster Krider, of Mineral Park, is largely interested in Gold Basin mines.

Roe Brothers, of the Park, will work a number of claims in the Salt Springs district thie summer.

Among other future millionaires at preseut working "*incog*" is J. W. Hass, who is running a 300-foot tunnel on the Woodchoppere' Relief.

Bob Steen, the eheriff of Mojave, is very popular among the minere.

The 10-etaup mill of Hon. John Howell, at Hockberry, ie cleaning up on a lot of chlorider'e ore, and will cloee down for some time.

Tbe Lone Star mine at Mineral Park ie the moet exteneively developed property in the county. It ie not working at preeent. J. L. Sanderson and othere of San Francisco are tbe ownere.

A emelter at Albuquerque and low ratee on oree will double Mojave county's output of bullion.

Prospectors are rustling among the hills, and the eeaeon'e work will develop a number of good mines.

Tbe *Mojave County Miner*, at Mineral Park, ie fully alive to tbe intereste of the miner and mine owner as well ae to its readere abroad. It deeervee the eupport of tbe community.

F. W. S.

Kingman, A. T., March 22, 1885.

A California View of the Eads Ship Railway.

Some time since, L. F. Moulton, a well-known reeident of Colnea, and who hae alwaye taken great interest in public enterpriees, especially thoee affec ing thie coast, wrote an extended letter on the subject of the Eads Ship Railway, which was published and attracted considerable attention. Space precludee our publishing it entire, but we make the following extracts:

To the Mechanics of California:—The farmer ie full partner with the San Francieco and other mechanics and manufacturers. Until we can get cheap freight we cannot raiee wheat to load ehipe to foreign countriee that can bring back *cheap* or *half* freights like coal, iron and all other raw material which is required to manufacture all classes of goode and machinery, cheap and good enough to compete with Eastern manufactured articles that will be brought at sufficiently low rates on the return wheat cars, so as to crush out our flourishing manufactures on this coast. It is reasonable to expect that if either become crippled by having to pay full freights—say one per cent per pound one way, and empty tbe other—tbat one of the partners must be crushed, thereby crushing both. Once our farming, our manufacturing interest, gone or crippled, and all other interests dependent upon once crippled, then the railwey companies would have to pay their taxes instead of refusing, as now. If tbey did not it would be hard indeed on those left, who had property and could not control the Government in their interest.

To the Farmers of California:—Our great distance from market is our great misfortune—the actual cost of transportation absorbs our profits.

Tbe past history of higb freights is a terrible lesson for us to study.

Is there any reason to hope that it will be better? We see no reasonable grounds for hope in the future. It bas cost 1¼ cents per lb. to market our wheat. This is more than it is frequently worth in the East. It would be so to-day were it not for tbe prospect tbat there would not be wheat enough grown to load the ships on tbe way thie year. The railroad, it may be claimed hy its agents, is now carrying for 65 oents per hundred to tbe very markets that are eometimes glad to get 65 cente for tbeir wheat. The head railroad agent, two weeks ago, said tbey could uot carry wheat for less than one cent per pound to New Orleans; tben it would bave to be reloaded in that yellow fever climate on to Liverpool ships; so that it would tben cost more than 1¼ cts. freight to Liverpool; then add our cost of raising, sacking and getting to the nearest sbipping points, and we would be toiling with no other future than inevitable ruin before us. If we have a little lower freight now, it will be just what we have dreaded and before pointed out; for do you suppose ships will again return to put themeelves under the despotic power of that railroad company tbat has proven itself entirely soulless and terribly despotic and grasping? Yes, in every instance where they bave bad the power, they bave proven themselves tyrents. Do you suppose they are any different now? You certainly could not be so silly as that. You know better. Tbe Hon. W. S. Green, in a well-written article in the Colusa *Sun* about a year ago, pointed out the fact that the railroad company would carry freight low for one season in order to discourage tbe return of ehips. Of course it created some adverse criticism by the railroad press.

I expected and every other farmer in the State expected to find euch to be the case, and we dreaded it, for the same reason that the sailor dreads the calm more than the storm. We need tbe etorm of competition to save us.

But, no matter bow much competition we may have, we cannot get rid of the fact that by water we are 14,000 miles away from the market, and by rail it actuelly coets more tban we can make to raise it and compete witb the fast increase of wheat produced nearer to market. We must have a cbeaper route, wbere grain will not, on tbe one band, have to be carried 14,000 miles, or be resbipped iu sickly ports on tbe otber.

Tbe ship railroad is our only bope. We must make our representativee understand our wishes. The Panama canal is tbe better of tbe two canale, but we have got to back down from our long-cheriebed Monroe Doctrine if we let monarchies get control of it as the English bave the Suez. Then again, it will take 25 years to build it. Tbere is 123 inches of rainfall and it ie 35 feet below eea level, with unknown quantitiee of water to contend witb, having no drainage for 30 feet in the bottom. It is one of the eicklieet climates in the world. The Nicaraugua I examined tbirty years ago. I thought then as I think now, that it can be built; but a canal with "locks" is too elow, too coetly and takee too long to build, for locke belong to a former age. Nicaraugua is aleo a bad climate. Tbey have jigger and otber fatal pests to contend with. Tbis progreesive age demands (if at all) a canal without locks (and it may be built by future generations), but we need in the next four years tbe railroad to croes our ehips from ocean to ocean. To defend eo long a coast as we would have to defend, to enforce the Monroe Doctrine and pay expenee of wars, would build eeveral ehip railroade. Then, again it would be tbe quickest way to settle the Monroe Doctrine to build our home route from tbe Gulf of Mexico inetead of going as far ae Nicaraugua or Panama to get into a row—and the safest way to avert a war is to hurry up the ship railroad. Then declining monarchies will not build another route for glory alone. If Eads' concession from the Mexican Goverment ie passed under control of our Government, as provided in this hill, then it protecte us from these eoullees corporations; hut let him be broken down by Page and the railroad company, tben his franchise will have to paes into other than United States possession; the railroad company will be sure to get a controlling intereet, ae they have just got of the new railroad, or else they will pool their issues as they have with the Panama Railroad. Our hope is in this cheap and speedy ehip railroad, and it under control of the United States Government.

THE bill for redietrioting the State of Nevada for judioial purposes, making one entire dietrict of the State, has passed the Senate.

MECHANICAL PROGRESS.

A New Manufacture.

Mr. Rosenzi, an Italian, has established a new manufacture at Bridgetou, N. Y.; or rather has re-established a lost art, that of manufacturing mirrors from obsidian. The results of his experiments are pronounced highly satisfactory.

The art of manufacturing obsidian mirrors was lost in the 12th or 13th century. It was re-discovered and patented December 23d, 1884, by Enrico Roscuzi, of Pittsburg, Pa. The obsidian mirror was long used by the ancients for looking-glasses, and by astronomers as reflectors on astronomical instruments. The substance, obsidian, is a kind of volcanic glass, artificially composed by the inventor, of ingredients such as ashes, silex, soda, lime, etc. The reflections in the obsidian mirrors are as clear and distinct as those seen in the brightest glass mirrors, but more subdued and condensed by a tint that gives the reflected images a peculiar charm. The perfection and beauty of these mirrors can be fully appreciated only by a personal examination. The high degree of polish of which this substance is susceptible adapts it above all other materials for tiles, plaques, bureaus, table tops, furniture garniture, etc. Any design in relief with raised or sunken figures can be pressed into this material. Being entirely opaque, it is adapted for fruit and other preserve jars, any kind of bottles, and especially for those holding drugs and chemicals not to be exposed to light.

Experiments with Steel Sleepers.—The experiments upon the Northeastern railway with iron sleepers have not been altogether successful. But the company are not at all disposed to abandon the idea of laying down metal sleepers. They are having sleepers rolled at Barrow on Mr. F. W. Webb's principle. They are rolled to the requisite tough-like section. Under each rail is a sole-plate to strengthen it there. The chair is formed of two jaws minds of steel plate, stamped into form, and ribbed centrally, so as to give strength to resist the pressure of the wedges. The jaws, sole-plate, and sleeper are united by rivets passing through the three thicknesses. The test will be very severe, because on the two miles on which the sleepers are to be laid there is a great deal of the roughest mineral traffic. The iron sleepers on Mr. Wood's system which these sleepers of Webb's are intended to replace were sufficiently elastic, and did not rust sensibly; but being seriously weakened by the large holes needed by Mr. Wood's peculiar fastenings, and these holes being situated on either side of the rail, just where the strain on the sleepers was greatest, the latter were continually breaking there. It became obvious that iron sleepers were right in principle but that the particular system tried is not yet perfect in detail.

Oxidized Surfaces.—Cast iron seems to have a color of its own that cannot be excelled by the finest tint that can be given by a coating of paint. The red oxide of iron, or the oxidation of the exposed particles, presents a surface that is very much admired for its durability and permanence, as shown in the browning of a gun-barrel with acids. Even the surface that has been allowed to dry with the acid still on, in which the casting has been pickled to remove the scale, is left brown with oxide that blends very beautifully with a petroleum wash, and leaves a very mellow tint that is not easily tarnished. The application of heat in the fluing of steel forms a similar coloring of oxide that prevents the further oxidation of the metal and brings out an agreeable color that is quite attractive. The wood-worker also is aware of all the changes in texture by oxidation and brings out the latent color in the finish of wood-work without any paint whatever, by etching the lumber, as soon as it is sawed into boards, with so small an air space between that they actually heat, sweat and ferment on their surfaces, by the oxidizing of the juices and saps, producing a partial decay similar in many respects to the rusting of iron.

Material for Shaft Bearings.—The material for the bearings or boxes of shafts has from time immemorial been a favorite theme for discussion among mechanics. Some claim that cast iron is the best material; others say that boxes lined with babbit metal come the nearest to perfect boxes of anything. The argument in favor of cast iron is based on the claims of economy, it being much cheaper than any other material, and they add that it runs easier, and will wear longer if properly lubricated, but we find by actually weighing the force or power required to overcome the friction of the two substances that the argument should be strongly in favor of babbit-lined boxes, the main trouble being to keep them properly lubricated. The best of boxes in the best regulated shops will occasionally run dry, and the risk of cutting a shaft is one that no one can afford to assume. With the best lubricators it is best, as well as practical, to give a shaft the odds, for in the long run all who try it will speak warmly in favor of the box lined with babbit or some other kindred soft metal.—*The Wood Worker.*

Bits on Belts.—There are few people who pay any attention as to how they put on a cross belt. The right way to do it is to put the belt on in such a manner that the driving pulley will have a tendency to rough up the splices; then when the splices come to the crossing they will smooth each other down instead of catching under the corners of each other and tearing open a splice. A quarter-twist belt should never be used where it can be avoided, but when it is used it should be as narrow as practicable, and the pulleys should be large. Increasing the width of a quarter-twist does not increase its power in the same ratio as in a straight or cross belt. There is not more than one per cent advantage in using an oiled belt with the grain side next to the pulley, which will hardly compensate for the ugly look which a belt presents when put on in that manner.—*American Wood Worker.*

Steel Shafts Forbidden. John Roach has received orders from the naval department to substitute iron for steel shafts in all the vessels he has under construction. This order appears to be the result of the investigation as to the reliability of steel shafts that was instituted after the accident to the shaft of the Dolphin during her trial trip. A good many engineers will say that the government has taken a backward step in abandoning steel for shafts, but we think on the whole the action is wise. John Roach has never had any of the iron shafts he put into steamers break, and the indications are that good iron is not so susceptible to the structural changes induced by fatigue as steel is. There is an impression among many mechanics that steel is treacherous, for it will break occasionally in an unaccountable way. Cases where breakage occurs under strains that a steel article ought to have withstood without distress, might probably be traced to natural causes were the matter properly investigated, but this has not been done, and so long "mysterious" breakages are common, the material will not have the entire confidence of the engineering world.

New Process for Working Iron.—An improved process in the treatment of iron has been brought to notice, the results of which are alleged to be very favorable, the product being very hard and tough—far superior, in fact, to ordinary rolled iron for any usual purpose. According to this method, wrought iron is heated to nearly a welding heat, is then rolled in sand, reheated to a somewhat higher temperature than before, and another rolling in sand is given; after that it is once more heated to the welding point and then immediately immersed in water, to which has been added common salt in the proportion of one gallon of salt to 12 or 15 of water, more or less. Among the advantages claimed to be possessed by iron made in this manner are those of being heated, worked, welded and otherwise manipulated without the destruction of any of its valuable properties.

The Physical Properties of Metals—A Prize Offer.—A Berlin paper says that a prize has been offered by parties in that city for essays, as follows: $250 for the best comparative examination of the several methods heretofore used for the determination of the hardness of metals and alloys, including an exposition of their sources of error, and limits of accuracy; and $750 for the best paper on the resistance to pressure of iron work in buildings, at increased temperatures. It appears that after a certain fire in a factory at Berlin, the police authorities issued notices concerning the use of cast iron columns in high buildings, and that these notices met with considerable opposition in many quarters, since it was maintained that neither practice nor theory had yet shown any proof that cast iron is less trustworthy than wrought iron in cases of fire.

Wasted Power.—The amount of power wasted by shafting out of line, badly lubricated, of insufficient size and imperfectly coupled, can hardly be estimated. Great as is this loss, that from badly laced, crooked, stiff and generally outrageous belting is but little less. In some establishments a belt lacing of sufficient size for the main belt of the establishment is considered plenty good enough to lace a three-inch belt with and is used accordingly. A punch large enough to make holes for the biggest lacings is, of course, necessary, and it has the advantage of answering for all sizes of belts. The apparent advantage of having but one size in a large establishment is captivating to the business department. The result in belt efficiency, however, is something which would astonish the counting house, if it could be made to understand the figures.—*Industrial America.*

Looking for American Machinery.—Commissioners from Chili will visit the New Orleans Exposition and report on the machinery most suitable for adoption by farmers in Chili. As labor is growing scarce and produce somewhat low at present, more machinery is required than formerly. The Government of Chili has for this reason devoted large space in the National exhibition at Santiago for the receipt of American machinery and manufactures, where they will be placed on exhibit by the authorities free of duty.

Steel Ships as Cheap as Iron Ships.—The manufacture of mild steel by the Bessemer process has been so greatly reduced in cost in England, that steel ships and iron ships of the same class are now offered at precisely the same price. This possibility arises largely from the fact that a steel ship of a given strength can be made of much lighter weight than one of iron,

SCIENTIFIC PROGRESS.

Where Did Life Begin?

President Warren, of Boston, thinks he has succeeded in solving the problem as to where animal and vegetable life commenced. His researches, he says, have led him to fix that point at the North Pole. The doctor sustains his theory with much energy and with a surprising array of evidence, and this in turn throws much light on the most vital of the current problems of biology, terrestrial physics, ancient cosmology, comparative mythology, primeval history, scientific anthropology, and Hebrew and ethnic traditions. He claims to have given to the work the study of many years. He says the poles were first fitted to produce life, which consequently commenced at the northern and southern extremities of the globe, developing independently, but to a certain extent corresspondingly, since conditions were similar. By the secular cooling of the globe the poles ultimately became unfitted to support life, and such forms as did not perish in the changes of the earth's surface slowly migrated toward the equator, changing in the course of ages, and ultimately giving rise to a fauna which, over most of the globe, consists of a mixture of northern and southern forms.

Many facts derived from the Northern Hemisphere lend support to this theory, and the Southern Hemisphere has recently added new facts which tell in the same direction. The animals of the Northern Hemisphere are still almost identical throughout the world's circuit. The same families and even the same species of mammals and birds are common to the north of the Old World and of the New. To give a few examples, the elk or moose, the reindeer, the beaver, the lynx, the wolf, the fox of Europe and Asia, are specifically identical with those of America. The bison of America is closely allied to the aurochs of Europe, the brown bear of Europe, to our own grizzly, the stag to the wapiti or elk, and and so on.

Remains of mammals now regarded as tropical, such as the elephant, hippopotamus, rhinoceros, hyena, lion, etc—are common in the tertiary strata of temperate and even arctic regions. This is proof of southern migration when climate changed. In the southern point of South America, in desolate Patagonia, have been found mammalian remains which tend to show that the tertiary fauna of Patagonia preceded that of the Argentine Republic, to the north of it. Forms of the pampas are there, but are somewhat more generalized, as though older. Hooker has shown that seventy-seven species of plants are common to South America, New Zealand and Tasmania. A small family of fishes (*galaxidæ*) and the marsupialia (kangaroos, wombat, opossum, etc.) are Australian and South American.

A sort of submarine plateau connects Staten Island (part of the Terra del Fuego archipelago) with South Georgia and other antarctic lands, and it seems not unlikely that a great antarctic continent once existed, the remains of which are Australia, New Zealand, etc., on the one hand, and Patagonia on the other. In Australia the marsupialia multiplied, and spreading northward, mingled with the horsal fauna that had been driven southward. In South America the marsupialia did not greatly multiply, though they spread, after the upheaval of the Isthmus of Panama, into North America, where they are represented by the opossum.

The edentata (sloths, armadillos, anteaters and their relations) first appeared in Patagonia in the miocene period, and spreading northward, became the characteristic animals of South America. Edentates (the aard-vark or Cape anteater, and the pangolins or scaly anteaters) occur also in Africa, which was probably once connected southward with the ancient antarctic continent.

In many cases the animals of northern origin, which are the more numerous, can be distinguished from the southern, but in other cases we cannot distinguish them, since on the one hand, animals which naturalists place in the same family on account of resemblances in structure may very possibly have had a distinct ancestry, and, on the other hand, the northern forms, which evidently predominate, have not only varied greatly in the course of ages, but have penetrated far toward the southern extremities of the continents. As regards the Northern Hemisphere, the resemblances between the fishes, insects and mollusca of the Old World and the New are even more striking than those of the higher animals.

Method of Removing Obstructions from Pneumatic Tubes.—No method has yet been discovered, it would appear, for removing obstructions from pneumatic tubes, preferable to that resorted to in Paris—ite location being determined by simply firing a pistol into the tube. The resulting wave of compressed air, traversing the tube at the rate of 1000 feet a second, strikes the impediment, and is then deflected back to its origin, where it strikes against a delicate diaphragm, its arrival being recorded electrically upon a very sensitive chronograph on which, also, the instant of firing the pistol has been recorded previously. The wave of sound, on reaching the diaphragm, is recorded, and thence reflected back—a second time striking the obstacle, and returning to the diaphragm. This operation being several times repeated, several successive measurements are thus made of the time required by the sound-wave to traverse to and fro within the pneumatic tubs. Other means have been applied to the accomplishment of the object in question, but this has proved to possess special advantages.

Santa Barbara Natural History Society.

We find in the Santa Barbara *Press* of the 7th inst. a report of a meeting of the Santa Barbara Natural History Society, held Feb. 22d. After some preliminary business several original papers were read, when Mr. Ford read extracts from a private congratulatory letter from Prof. Henshaw on the purchase of the Clark collection. The professor, in his letter, said that he had succeeded in obtaining vocabularies of the languages of the natives racss in San Diego. Mr. Ford, also, read from a privats letter from the distinguished botanist, Dr. Asa Grey, from which it appears that the doctor contemplates a visit to Santa Barbara. We notice, as a pleasant and commendable feature in connection with this society, that it contains quite a number of lady members, several of whom take an active interest in scientific matters. Rev. Mr. Weldon addressed the society upon the subject of the late, and still pending controversy, the antiquity of the Calaveras skull, and, also of the human remains found, together with those of extinct species of animals, in the auriferous gravel beneath Table Mountain, Tuolumne county, Cal. Mr. Weldon said that he had visited the rooms of Dr. L. G. Yates, of Santa Barbara, and had there examined plaster casts of the fossils, said to have been discovered beneath Table Mountain. Some of these casts, beyond question, represented perfect human hands. They were more perfect than any yet found in Europe. He doubted that they were of the Pliocene age. They were more ancient than the Calaveras or Whitney skull and were, without question, genuine. No remains have ever been found before to which such age could be attached. But he doubted that a drift formation, overlaid by a lava formation, could have said to belong to the Pliocene age. The casts, which he referred to, are the most interesting specimens in any museum in the world.

C. W. Clark and George W. Coffin were unanimously elected members, and the names of Harvey Jacobs, Henry Short, Alex Silas Bond, Dr. J. B. Shaw and Capt. W. E. Greenwell, were presented by H. C. Ford and Clark P. Streeter for membership.

The Value of Sponge for Filtering Distilled Water.—Experiments have shown that sponge is very valuable for filtering material for distilled water—the operation going on with great rapidity, while the product is remarkably clear. Distilled water, when filtered through paper, soon exhibits a sediment which is never formed when filtered through sponge. This improved apparatus consists of a bottle with an opening near the bottom, from which descends a bent glass tube, with a perforated rubber stopper at each end bearing a narrower glass tube. The wide tube contains one or two long strips of fine sponge that have been cleaned with diluted hydrochloric acid and then dried. The sponge should be cleaned every few months.

Cocoa Powder.—A New Explosive.—This powder is referred to in European journals as an improved explosive for many purposes. It is used at Krupp's factory. It is claimed that with equal pressure it gives greater velocity to a ball than can be attained with ordinary powder. Its smoke is said to be less dense and to clear off more quickly. It is brown, or rather, chocolate colored. In sundry tests about one-seventh less of it was needed than of ordinary powder to produce given results. Its merit is that of beginning its combustion moderately and steadily and then when the projectile has started through the bore, burning with great rapidity.

Velocity of a Cannon Ball.—A London scientist says that the highest velocity that has been imparted to a cannon ball is 1626 feet per second, equal to a mile in 3.2 seconds. The velocity of the earth at the equator, due to rotation on its axis, is 1000 miles per hour, or a mile in 3.6 seconds; and thus, if a cannon ball was fired due west, and could maintain its initial velocity, it would beat the sun in its apparent journey around the earth.

A New Destructive Missile.—A new shrapnell shell for 100-ton guns has been invented by an Italian admiral. At 30 yards from the cannon's mouth the shell bursts, throwing forward 75 smaller projectiles, which in their turn burst into a fan-shaped shower of balls and fragments of metal with terribly destructive effect.

Plant Intelligence (?).—A London botanist has endeavored to prove that plants have a certain form of intelligence, and are able, at least, to exert as voluntary power as certain lowly organized animals. One proof of this is the plants' avoidance of obstacles placed artificially in their way by bending aside before touching.

An Astronomical Observation of an earthquake was lately made by the director of the observatory at Nice, France. He was watching one of Saturn's moons at the moment of the shock, and the motion imparted to his telescope caused the celestial object to appear to move some 15 or 20 seconds to the right.

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SAN FRANCISCO:
Saturday, March 28, 1885.

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Passing Events.

As we write (Thursday afternoon) telegraphic news announces that war is probable between England and Russia. While it is hardly proper to express pleasure at the misfortunes of other nations, war between these two cannot fail to be of benefit to this country, and to this State in particular. America will be called on for supplies, and California wheat ought to be largely increased in value for export. At least, these are the opinions which find expression among our people.

In another column, reference is made to the trouble among the Wood River mines over the wages question. It is hoped by this time that quiet once more reigns.

The Old Dominion copper mine in Arizona will probably have to reduce its product for a while, for the reasons given in the item in our mining summary. The mine is a great copper producer.

The cloudy weather early in the week gave hopes of rain though but little has fallen. There are fears of a "dry season," though it is too soon yet to give up all hopes of an abundant rainfall, for April is often a rainy month with us.

ONLY about 964 tons of fine copper were sent to England from this country in February.

Working Cupriferous Pyrites.

Hydrochloric acid being a waste product at the chemical manufacturing centers in Europe, is there largely used as a solvent of copper oxide, and to assist in the decomposition of sulphurets; but far more copper is rendered soluble by the action of salt on sulphureted ore in the roasting furnace than by the direct action of acid. Longwaid's original patent of 1844 was a method of extracting copper in this way, and Henderson long afterward patented the essential points of Longwaid's process, adding to the roasting furnace a tower to condense the gases evolved in the calciner, and thus acidulate the leach liquors. As practiced at present in England, where about 20,000 tons of metallic copper a year are made by it, the following are the steps of the process:

The pyrites cinder as it comes from the acid works contains on an average: Copper as sulphide, 1.65 per cent; copper as sulphate and oxide, 2.10 per cent; iron as sulphide, 3.64; as peroxide, 77.40; silver, 0.0037 per cent; there are also small quantities of zinc, lead, lime, arsenic, etc.

There must be at least as much sulphur present as there is copper. The cinder is ground through screens with eight holes to the linear inch, 8 to 17 per cent of salt being added, according to the furnace used. The quantity which can be chloridized per day varies with the furnace used, but the rate of calcination may be set down, according to Mr. James Douglas, Jr., at 9 to 10 tons per day per furnace, fed usually in three charges. The heat is never varied above a dull red, the limit within which the copper is most effectually chloridized without being volatilized. Where gas furnaces are used extraneous heat is applied for about three hours. By that time the reaction between the sulphur and salt is proceeding vigorously, and the gas is turned almost off, for the heat evolved in the roasting mass, which is repeatedly rabbled, maintains a sufficient temperature. The chlorination is completed in 6½ hours, when the charge should contain 71 per cent of the copper as chloride; 4 per cent (or not over) of the copper as subchloride; 20 per cent of the copper as oxide and 5 per cent (or not over) of the copper as sulphide.

Muffles, or combined muffles and reverberatories, as well as mechanical furnaces, are used; but in all cases the gases are carried from the furnace through Gossage towers, where an acid leach liquor is obtained. But generally the acid thus condensed is insufficient to dissolve the oxide of copper in the roast, and free hydrochloric acid has to be used as a final bath. The chloridized ore is thrown hot upon the false bottom of large wooden leach-tanks, holding 10 tons, and is washed first with weak liquors from a previous operation, then with water, and finally with the tower, and if necessary with additional acid liquors. The filling, leaching and emptying occupy 48 hours. The liquors passed to the precipitating vats contain from five to six per cent of copper. The residues generally contain: Copper 0.15 per cent; iron as peroxide, 90.61 per cent, which equals 63.42 per cent of metallic iron. The precipitation is always effected by iron, and the chlorides of iron and sodium, and sulphate of soda in the resulting liquors are run to waste. The consumption of iron is from 100 to 120 parts to 100 parts of copper.

No other humid method is carried on anywhere so extensively and successfully as is this by the 25 pyrites companies of Great Britain, as well as by works in Belgium and Germany. The New Jersey Extraction Company, in this country, also uses it. Roasted cupriferous pyrites is undoubtedly the best suited for it, for the peroxide of iron, as shown by Macfarlane, plays an important part in bringing about such exact results. An ore of much above four per cent cannot be advantageously treated, the chlorination being imperfect, and a larger amount of subchloride of copper being formed than there is alkaline chloride in the liquor to dissolve. The large consumption of salt precludes the use of the method where that reagent is expensive. Hence various plans have been proposed, and to a certain extent adopted, to use the waste liquors or their saline contents as solvents, in what are known as regenerative methods.

THE Lake Superior mines produced 3,215 tons of copper in January.

The Wood River Mines.

For some time there has been trouble in the Wood River mines, concerning the wages question, an attempt being made to cut miners wages to below $4 per day. A number of miners were finally arrested for "conspiracy." There are several miners' unions in the camp. Recently the president of one of them made a speech, saying that the miners should be paid $4 per day, or the "streets of Broadford and Bullion would run with blood." A line of armed men was formed. The president of another of the unions, however, stopped any advance, and got the men to discuss the matter. The men at the Queen of the Hills mine quit work and went to the meeting. The miners at the Minnie Moore also quit. The Wood River *Times* says that afterward, on the morning of the 18th, several of the deputy sheriffs guarding the mine quit their job, because of the sheriff's action in stopping the union men from going to the mines, where they would have been hotly received, and bondsmen, representing $20,000 of the full amount, withdrew from Sheriff Furey's official bonds. However, his action was considered wise by many, as it averted an additional debt on the county of $50,000 or $60,000, and saved the lives of 20 or 30 men.

The Governor and General Brisbin arrived that day, and made an examination of the situation, which resulted in the further quieting of the disturbed condition of affairs, and subsequently the replacing of men in the mines. In the meantime the citizens of Bellevue organized a committee of safety to patrol and guard the town at night, and the members of the committee are called by the union men "stranglers," to whom the most opprobrious epithets are applied. A serious collision between the "stranglers," and the union men was at one time threatened in the streets of Bellevue, but the peace officers succeeded after much trouble in restoring quiet.

It is stated now that about 40 of the ring leaders of the union will be arrested, and the prosecution against them be pushed vigorously; also, that the mines are now working nearly full forces, and that work in the mines would probably now continue uninterrupted.

The Wiswell Machine at Work.

In our issue of March 7th we published a description of the Wiswell Pulverizer and Amalgamator, accompanying the same with a cut illustrative of the machine; which, as stated at the time, was being set up at No. 461 Howard street in this city. Last week several runs were made on small quantities of barren rock to test the crushing capacity of the mill; also one run on a lot of 850 pounds of ore, from the Sulphur Creek District, Colusa county, brought in by Capt. Lightner. This is notoriously a refractory ore, carrying nickel, cinnabar, arsenic and other base metals in such large proportions that little has ever as yet been done with it, though known to be rich in gold. From this lot of ore, we are informed, there were extracted 2½ ounces of gold—90 per cent of what fire assay showed it to contain.

This is not the first attempt that has been made in San Francisco to work this Sulphur creek ore. But in all the trials heretofore made, from 50 to 60 per cent of the gold it carried has been lost, or at least escaped in the tailings. Captain Lightner, who has had large experience as a millman and amalgamator, expressed great satisfaction at the results of the trial.

On Wednesday last, further experimenting with the machine was had, with a view to more fully testing its crushing powers. On this occasion the run was made on rock obtained in this vicinity and not supposed to carry much, if any, precious metal. The rapidity with which this material, a hard quartz, was ground to powder, seemed to take the crowd in attendance quite by surprise, notwithstanding it was made up wholly of mill builders, miners and others familiar with the various kinds of crushers. Some of those present, in their admiration of the work done, went so far as to say they believed this machine would at once begin to take the place of stamps, and perhaps supersede them ultimately.

The Wiswell pulverizer and amalgamator will be run every Tuesday and Friday for the accommodation of those who may desire to witness its operations, and at such other times as parties having any considerable lots of ore may wish to have the same worked. For the present such work will be done gratuitously, the owners receiving whatever gold or silver their ore may contain.

Working Gold Ore in Brazil.

The famous St. John Del Rey mine, in Brazil, returned a small profit for the last half year, which has not been the case for the two preceding half years. The yield for the last half year was 12.551 ounces of gold, against 11.457 ounces for the previous six months. For the year before this, the company were losing about $5,000 per month. The net profit on working the Morro Velho mine the last six months was £3582.

It is noticeable that the cost of raising and treating the ore in Brazil—25s 2d per ton—is pretty high. The loss of gold in treatment is, also large, viz., 34 per cent. We can do much better than this in California. The directors are seeking for improvement and greater economy in working. It might be well for them to examine our gold working systems at the best California mines.

Their expenditure last year was, however slightly reduced, and the yield of mineral was improved, otherwise they would have suffered a loss as in the two half-years previous. The quantity of mineral raised during the half-year was 31,039 tons; during the preceding half-year, 32,617 tons. The quantity of mineral stamped during the half-year was 30,070 tons; during the preceding half-year, 31,680 tons. The quantity of killas rejected during the half-year was 702 tons; during the preceding half-year, 1,141 tons. The quantity of sand amalgamated during the half-year was 46,044 cubic feet; during the preceding half-year, 45,128 cubic feet. The average yield of the 30,070 tons of mineral stamped during the half-year was ·407 ozs. troy per ton; for the whole of the preceding year, ·348 ozs. troy per ton. The loss of gold in treatment has been within a fraction of what it was last year—34.50 per cent. Thus, though the proportion of killas rejected during the half-year was considerably less than during the preceding year, the yield had appreciably improved, and that, as the recovery had been the same the improvement was consequently in the quality of the ore quarried.

The average monthly working cost for the six months was £6440. The average for the preceding six months was £6656., and for the corresponding period of last year £7281. The produce of gold from the Cuiaba mine for the last half-year has been 1701 ozs. troy; the produce for the preceding half-year was 1714 ozs. troy. The quantity of mineral stamped, and the recovery of gold therefrom for the half-year was 9667 tons mean, averaging .1776 ozs. troy per ton. The average assay of the mineral stamped during the half-year was ·3516 ozs. troy per ton, so that only one-half the gold contents of the mineral was recovered.

The total working cost on this mine for the six months has been £5026 4s. 2d., and there has been extended further on explorations and watercourses (ordinarily charged to capital account) £956. 1s. 2d., making the total outlay £5982. 5s. 4d. The gold extracted realized on sale in London £6121. 10s. 6d., thereby more than covering the total outlay.

The Nevada Bullion Tax.

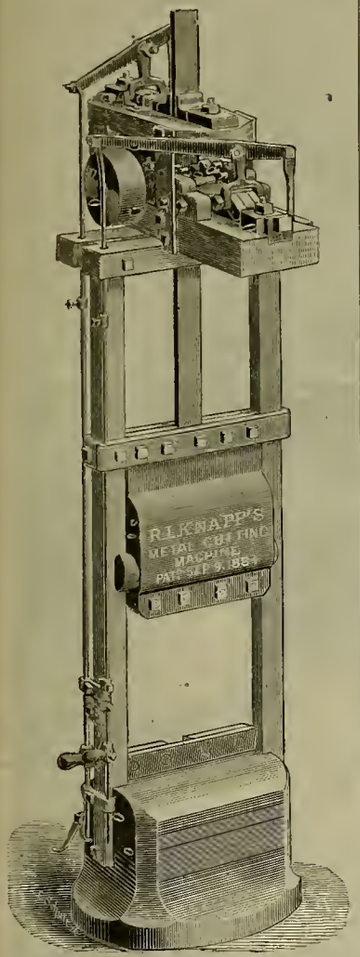
For a number of years Nevada has levied a tax on the gross bullion yield of the mines, without taking into consideration the cost of producing the bullion. The tax has been an onerous one, especially of late, when the product of many of the mines has been small, and there has been little profit. A new law was recently passed by the Legislature, which provides that all ores, tailings and mineral-bearing material of whatever character, shall be assessed for State and county taxation, but it provides a better method than formerly, by taxing net proceeds, as follows: From the gross yield, return or value of all ores, tailings or mineral-bearing material, of whatever character, there shall be deducted the actual cost of extracting said ores or minerals from the mine, the actual cost of saving said tailings, the actual cost of transportation of said ores, mineral or tailings to the place of reduction or sale, and the actual cost of such reduction or sale; and the remainder shall be deemed the net proceeds, and shall be assessed and taxed as provided for in this Act.

New Metal Cutting Machine.

The usual method of cutting steel or iron bars or plates is by means of power or hydraulic shears which operate with a slow motion and under great pressure. Mr. Robert I. Knapp, of Half Moon bay, San Mateo county, has patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, an apparatus for this purpose, in which he employs the momentum of a falling or steam driven weight, carrying one of the shear blades so that it passes the other, which is stationary and upon which the plate to be cut may be held.

The engraving on this page represents the new machine as operated by a weight. There is a heavy metal base having one of the shear blades fixed to it. The guide posts are arranged on the weight bits accurately while it slides up or down. In the lower face of this weight is fixed the other blade of the cutting shears. The two blades are so fixed on their respective supports that their cutting edges will pass each other with a shearing action, one end of each being nearer together than the other end.

In order to raise the weight and control the movements, it is provided with a stem which extends up between rollers secured to shafts at the top of the guides. The driving shaft is driven by a belt on the pulley. The shaft of



KNAPP'S METAL CUTTER.

one of the rollers is journaled in a support which may be moved horizontally to or from the other roller-shaft, and this motion causes the rollers to clamp or release the stem to raise or drop it.

In order to move this support, it is fitted into horizontal guides and has one arm of a knee, or toggle-joint, connected with it, while the other arm of the joint is fixed to an adjusting plate or block. The center-pin of the toggle is connected with a lever by a link, and the long arm of the lever has a rod extending down alongside one of the guides, as shown, to a point within easy reach of the operator, while the short arm has its fulcrum in the post.

When the rod is pulled down, the toggle levers are straightened, and the slide or support carries one of the roller shafts closer to the other, until both rollers press upon the stem of the weight with sufficient force to raise the stem, and with it the weight and its blade.

A collar is fixed by a set screw on the rod, and there is an arm or projection on the weight, so when the weight reaches the desired hight it strikes the collar, and the lever is operated so as to relieve the roller from the side of the stem sufficient to let the weight drop. If it is desired to hold the hammer at its highest point, a hinged block is so placed as to allow itself to be turned up as the stem moves up, and when the rollers are relieved from pressure, and the stem begins to drop, the block falls against the stem and binds and holds, a similar block on the other side also pressing against the stem. Suitable mechanism is also employed to withdraw the clamping blocks from the stem to allow it to move freely when it is desired to drop the weight-stem and blade. A bent lever, has its angle fulcrumed in a support, so that one end of the lever stands just beneath the end of the rod, and the other depends to a point near the ground, so that the operator can touch it with the foot and then lift the rod and draw

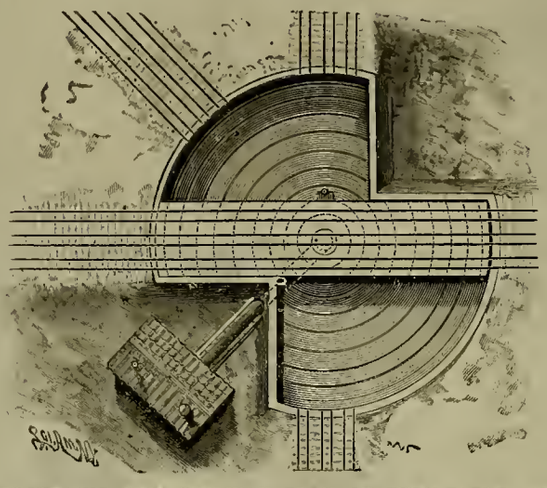


Fig. 2.—INTEROCEANIC SHIP RAILWAY—PLAN OF TURN-TABLE. (See P. 201.)

the block back, when he desires to drop the hammer.

A collar is fixed to the upright rod at such a point that when the blade has descended so as to cut the bar or plate, the arm on the block will strike this collar and force the rod, lever

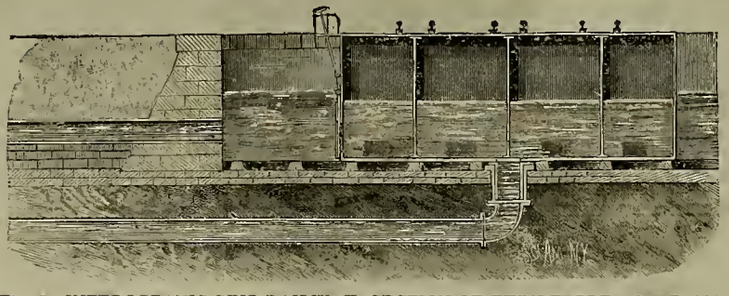


Fig. 3.—INTEROCEANIC SHIP RAILWAY—SECTION OF TURN-TABLE. (See P. 201.)

and center of the knee joint down until the rollers are again pressed against the stem with enough friction to instantly raise the movable shear-blade for another blow. Another collar is fixed on the same rod below the guide, and of such a shape that when the rod is forced down by the dropping of the shear-blade, this collar will strike the end of the pawl and release it from the rack on the other rod. The weight of the rod will then bring it down, and by its action on the lever and toggle will force the block forward so as to again be in contact with the stem, and ready to clamp and hold it when it reaches the top of its stroke.

This machine has been in practical use for the last two years at Mr. Knapp's plow manufactory at Half Moon Bay. He estimates that it will do three times the cutting of ordinary machines. Mr. A. H. Knapp held a watch on them while at work and saw them cut up 275 pounds of ⅜ steel into plowshares in eight minutes.

Mr. Knapp left here a few days since for New Orleans, where he will exhibit one of these machines. He also combines with this a power punch and press, with little additional expense. Mr. Knapp is the inventor of the well-known Knapp side hill plow, the first revolving side-hill plow made on this coast. In making these plows he found the expense of cutting steel so great that he studied out this improved device. This invention will undoubtedly attract attention among iron and steel workers at New Orleans, and reflect credit both on him and his State. He has not only patented the invention in the United States, but is procuring patents in all important foreign countries as well.

Governments and Mines.

Foreign Governments exercise a much closer watch over the details of the mining industry than ours does. In fact ours does very little one way or another. Congress makes laws for the miners and that is about all it does. The mines are worked in any way the owners like, without any restriction. Abroad there are Government inspectors, commissioners, etc., who look after details of work, with a view mainly of compelling proprietors to adopt and carry on systems to prevent accidents to the laboring miners. In some respects this Government surveillance is beneficial, and in others it is irksome. Take France for instance, where they have so many commissioners of all sorts, inspectors, captains, etc., that they must be a nuisance. And the Government there even has among its monopolies that of gun-powder, which operates as a heavy tax on mining. The price of powder is three times greater than in England, and as the state of the coal measures in France necessitates much more blasting than is required in England, the cost of getting coal is thereby considerably enhanced. In these times of prolonged commercial depression, matters like this assume a degree of importance that would not attach to them at other times. When mine-owners are striving to prevent the total disappearance of their now narrow margin for profit by the exercise of a rigorous economy in every direction, this tax is felt with irritating severity. Discontent with the extortionate action of the Government often finds expression, and it seems likely that ere long an agitation will be set on foot to obtain a reduction of the price.

In this country people can buy their powder where they like, and they can experiment with all kinds. Competition among the various companies brings prices down very low, so that only a fair profit is made by the manufacturers. A monopoly of this kind of thing cannot last very long among us. Large profits bring in many competitors, as we have seen by experience on this coast, where for a time powder was sold about at cost.

On the whole, our miners are about as well off in this country as anywhere in the world. The Government lets them alone, which seems the best way after all.

COPPER in Liverpool was selling at £7 10s. below the average of 1884, and £16 below the average of 1883. With such prices many mines must work at a loss.

An Electrical Bullet Explorer.

A new electrical apparatus for accurately locating the position of bullets in the human body, has recently been invented and made by Dr. James B. Williams, at No. 759 Market street, the inventor and maker of the surgical apparatus for removing abnormal growths by electricity, which was described in this paper in September last.

The new "Explorer" is contained in a small mahogany case, and consists of probes, alarms, switches and a generator of the electric current by which the apparatus is operated.

The probes are encased in gum webbing, and are so flexible that they may be *tied into knots* without fear of injury, and they will readily adapt themselves to any path a bullet may make. The ends are of pure gold, upon which the fluids of the body can exert no chemical action, thereby insuring a clean and absolute contact with the ball; while their shape is such that they will readily adapt themselves to either convex, concave, or flat surfaces. Laceration of the tissues by their passage, or of obstruction to their passage by the tissues, is next to impossible.

The indicating mechanism is operated by the current from a "dry" pile, and consists of an alarm which is sounded as soon as the probes come in contact with the ball, and an upright needle which swings through an arc of 150°. The alarm ceases to sound, and the needle returns to its normal position, as soon as the contact between the probe and the ball is broken. Either the alarm or the needle may be used as circumstances may require, both being controlled by ingeniously constructed switches. Both the indicating mechanism and the pile are permanently fastened to the inside of the case; the mechanism is supplied with testing appliances, thereby insuring its perfect operation before the probe is introduced.

The new dry pile which supplies the current is the Doctor's own invention, and has been perfected only after a long series of experiments. It will undoubtedly supersede hundreds of batteries now in use for domestic and other purposes, as it occupies but a very small space, is remarkably cheap, and after being set up can be attended to by a mere novice. The currents from it are very powerful, and as the pile derives its moisture from the atmosphere there is no free liquid, and the elements may be placed in cases of any desired shape. A pile sufficiently powerful to ring bells, light gas, etc., in a large building can be placed in a case measuring not more than 4 in. long, 3 in. wide and ¾ of an inch deep. For portable, medical and other apparatus, as well as numerous other purposes, it is superior to any of the chloride of silver batteries now in use, Skrivanows not excepted. The pile at present used in the "Explorer" consists of 8 plates, each measuring 2x1 inch, and will furnish as strong a current as 6 large gravity cells. Comparative tests of the new pile with standard batteries will soon be made, the results of which will appear in a subsequent issue.

Army surgeons and others who have examined the "Explorer" pronounce it to be perfect and destined to supply a long felt want. Every surgeon is cognizant of the fact that the results of explorations for bullets by the best appliances now in use are all but satisfactory, in many instances amounting to complete failures.

It is but justice to Dr. Williams to state that his electrical inventions have attracted considerable attention in the Eastern States, the articles describing them having been copied from this paper into several of the medical and scientific periodicals published there. He has recently received a communication from the Secretary of the American Institute of Electrical Engineers, informing him that the Council would raise him to the rank of full membership. As far as we are informed, he is the only person on this coast who has been thus complimented. The Institute was founded by Edison, Keith and other prominent electricians of America, and numbers nearly 300 members, the greater portion of whom are but associate members.

A CHABOT has presented Oakland with $4,000 to purchase a transit instrument, chronograph, sidereal clock, mean-time clock, break-circuit chronometer, standard barometer and thermometer and polarizing eye-glass for the observatory which bears his name.

Tintic, Utah.

EDITORS PRESS:—During the calendar year 1884 there has been mined and exported from Tintic mining district an estimated gross valuation of ore approximating $1,532,954.40; 21,808 tons of lead silver smelting ore, 1,282 tons of copper silver and gold smelting ore, 808 tons of milling ore, and 25,000 tons of iron ore. On the lead silver, copper silver and milling ores collectively there is a possible net profit of something near $300,000. As these ores are shipped outside of the district for reduction, the smelters make a possible net profit of $10 per ton, no portion of which ever returns to the district to aid in the development of properties or benefit it in any way. The Utopia of the Rose of Tintic Mining Co. consists simply in the combination of mining properties with reduction works, so that a proportion of this profit, now I may say lost, will be used to aid future operations in mines, not particularly as a fixed investment, but as a working capital, as I term it. The mines are all looking well here in Tintic. James Rohbins, Esq., who has spent about $20,000 on his Mono, just east and parallel to Eureka Hill, has lately opened a fine body of ore high in silver assay. John Beck, Esq., manager of the Bullion Co., began sinking a new double compartment shaft about 100 feet southerly from present hoisting works, at a depth of about 60 feet from the surface. He has encountered a fine ore body, high in silver assay. The Eureka Hill Company has purchased the Red Bird Consolidation property. The Eureka Hill mine, the Red Bird Co. and the Keystone, are under one ownership, of which J. Q. A. Packard is president, Captain John McChrystal, manager (or, as we used to say in the Lake Superior county, mining captain). All are being vigorously worked night and day. Nothing is yet being done at the Mammoth Co. property. Captain G. D. Johnson is working the property of the Con. Julian Law Mining Co., chiefly under leases. Dr. John F. Ely, of Cedar Rapids, Iowa, is president, and Hon. Samuel P. Ely, of Cleveland, Ohio, is treasurer. Other properties are also being worked. The *Tribune* wanted $50 to $60 per column this year, so that we had but little in their New Year's issue. We could not afford it.

Eureka, Tintic, Utah. J. C. CAMERON.

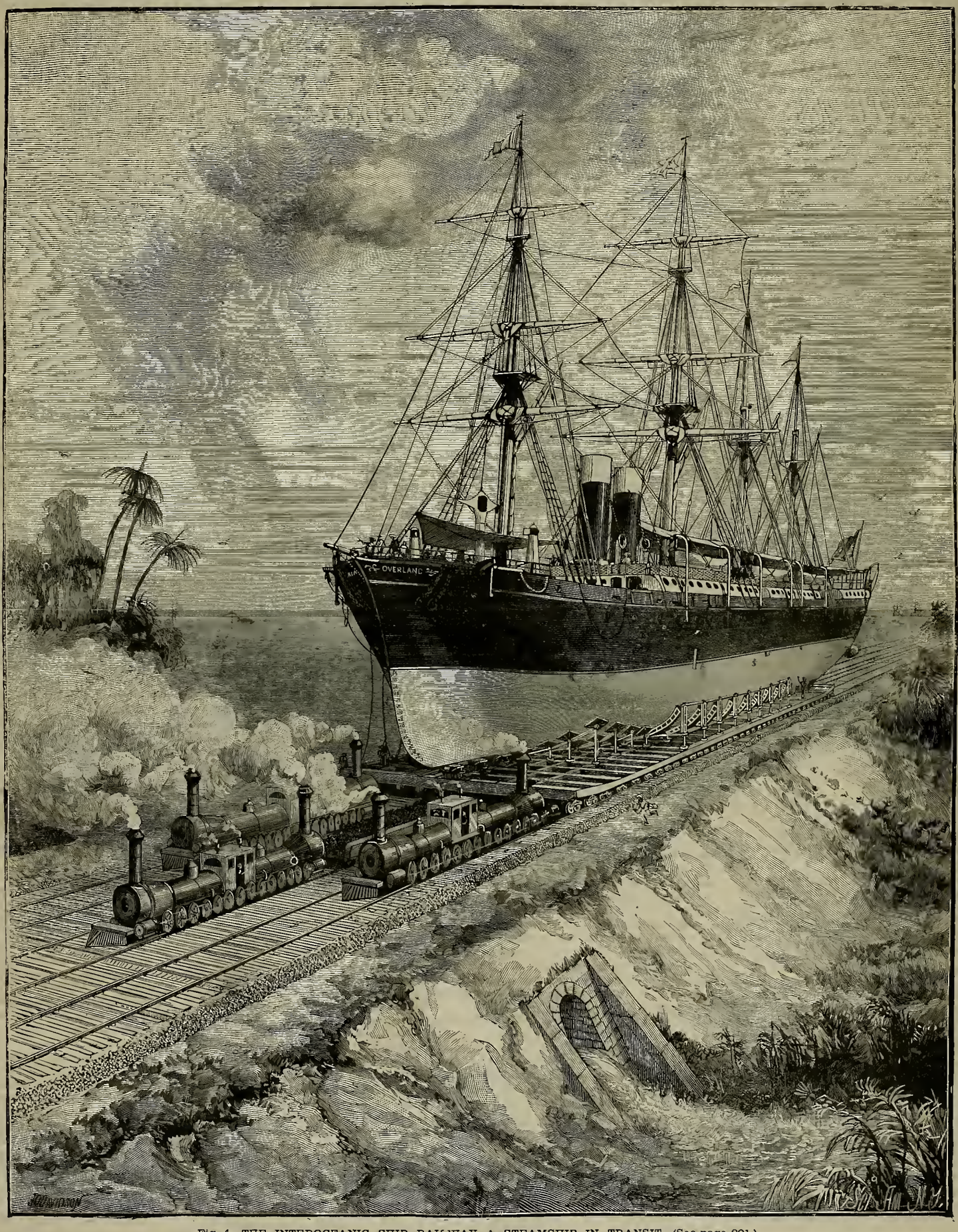


Fig. 4.—THE INTEROCEANIC SHIP RAILWAY—A STEAMSHIP IN TRANSIT. (See page 201.)

Engineering Notes.

Comparative Strength of Granites.

In his twelfth annual report of the "Geological and Natural History Survey of Minnesota," lately published, Prof. Winchell, the State Geologist, gives a useful article on the comparative strength of the New England and Minnesota granites.

The experiments in question were made under the direction of Gen. Q. A. Gillmore, by Mr. James Cocroft. The tests applied were to determine the crushing strength. The test pieces were two-inch cubes, unpolished. Crushed between steel plates, the average strength of 20 specimens of Minnesota granite was found to be 104,800 pounds, or 26,200 pounds per square inch of surface. Crushed between wooden cushions the average strength was 93,272 pounds, or 23,318 pounds per square inch. The average obtained by Gen. Gillmore, in 1875, for 20 New England granites, was 59,785 pounds, or 14,756 pounds per square inch.

The age of Minnesota granites is known to be archæn; that of the New England granites is not yet definitely known.

The surprising difference in crushing strength between the rocks of the two localities is most noteworthy, and to determine just what the cause may be, a careful investigation of their physical characteristics would probably give instructive results.

The Most Economical Cargo Steamer Yet Built.—Half an ounce of coal does not appear an extravagance of fuel to propel a ton of merchandise a mile, but it is sufficient, says the *Mechanical World*, if used in the most improved and economical method of developing its energy, that is, in boiler and engines of a steam vessel, as proved by the steamship "Burgos," which holds the proud distinction of being the most economical cargo steamer yet constructed. On a recent voyage from Plymouth to China, it is stated she carried a cargo of 2,500 tons. During the first part of distance, viz., from Plymouth to Alexandria, 3,380 miles, the coal consumed amounted to 126 tons, or 282,240 pounds. The consumption per mile would therefore be only 83.05 pounds, for each ton of cargo per mile would be 0.33 of a pound, or about half an ounce. It is quite possible that the wind may have helped to produce this favorable result, but it is astonishing when we consider, that by burning a box of matches, energy is set up equivalent to the amount of work done by a man, carrying a hundred weight for 20 miles at a rate, too, of at least three times faster. In fact, taking the element of time into consideration, a man would have to walk 60 miles to do an equal quantity of work.

A Discouraging Outlook.—The N. Y. *Times*, of February 23d, says: A clear, full statement of what has been done by the Panama Canal Company is given by a thoroughly informed correspondent this morning. The most conspicuous fact is the disparity between the outlay required to complete the canal and the money in the hands of the company. It is within bounds to estimate that 700,000,000 francs are necessary, in addition to 730,000,000 already secured, in order to complete the excavation and pay the current interest charges. The correspondent's conclusion is that at the present rate of construction it will be impossible to finish the canal for years beyond the time fixed for its completion. The problem of providing against the freshets of the Chagres river is one of the most difficult with which the company has to deal. The chances seem very much against the completion of the canal in the lifetime of De Lesseps.

Panama Canal Agitation in 1780.—From Germany it is learned that a curious historical document concerning a Panama canal exists in the archives of Venezuela (which, by the way, is not a "city" as some of the Continental papers say it is), bearing the date of 1780. A canal project, this document records, was broached in the reign of Phillip II, but Flemish engineers surveyed the territory and declared that the obstacles to the undertaking were insurmountable. "Native governers," continues this record, "thereupon pointed out to the king the enormous commercial disadvantages likely to arise in Spain from such an undertaking, in consequence whereof Phillip II issued a rescript which threatened with death any person alluding, by word or writing, to the project.

The Cable System.—The cable system of street car propulsion has received a noteworthy extension during the past year, by the construction of about ten miles of such railway for several of the leading street railway companies in Philadelphia, and which was about ready to be put in operation at the close of 1884. It is in contemplation to considerably extend these lines, and if the plans at present decided on are carried out, there will shortly be no less than 20 miles of cable railway in operation in this city. The system in question is in successful operation in San Francisco, Chicago, Detroit and Kansas City.

Night workmen in New Haven, and more particularly the brakemen and others employed on railroads, are suffering from a new eye disease, attended by inflammation, sharp pains and practical loss of sight. As a rule the disease lasts about ten days and then disappears.

Useful Information.

Antiquity of the Trade Mark.

Editors Press:—Regarding the antiquity of trade mark mentioned in your number of January the 24th, I would like to inform your readers that the earth of Lemnos was sold in bowls as patent medicine, by the priestesses of Ephesus, who marked the same with the seal of Diana, representing a goat. It was a little before the siege of Troy that appeared for the first time the usage of minerals in making medicaments. Monopoly took hold of that trade, and no one could sell any medicine of the kind, without having affixed on it the seal of the prince or priest of the place where such mineral came from. Yours respectfully, D. Bloch.

Randolph, Coos Co., Oregon.

Preservation of Wood.

The decay of wood, when exposed to the action of time and weather, is the result of a sort of fermentation process produced by the action of heat and moisture in the watery and albuminous ingredients of the wood, which gradually converts the sound timber into a rotten mass and renders it useless for any mechanical purpose, this process at the same time being assisted by the boring insects that make their homes within the cells of the decaying wood and live on the nutriment of the juices.

The fence builder is led to believe that a post will last a great length of time if only set opposite in the position from which it grew. A coating of oil and charcoal is supposed to protect the posts that enter the ground till not a man will live to see them rotted. Heating till quite a depth has been converted into charcoal has not prevented the process of decay or kept the insects from eating the cooked food within. A change that will make use of the whole material must meet a process of preparation that will reach the entire depth of the wood. Timber that has been steamed under a pressure of 100 pounds to the square inch must feel the effects of heat in all the liquid ingredients contained within the pores, especially when the pressure is reduced and the vacuum pumps put on.

In the creosote process the timber is confined within a large cylindrical boiler and held under a pressure of steam till it has penetrated the wood and vaporized all the fluids within the pores. The pressure is then removed, even the atmospheric pressure, when the creosote is injected and forced into the wood by raising the pressure as before. The object of every rational treatment is to harden the albumen contained in the fluids within the pores of the wood, and nothing short of a complete change, making a different solution entirely, will ever arrest fermentation and destroy all the germs of animal and vegetable life, and enable the woods to effectually resist the destructive effect of fermentation and insect ravages.—*Boston Journal of Commerce.*

A Satisfactory Experiment—Pumping Molasses.—A large Philadelphia house, which requires for its business a daily supply of some 18,000 gallons of imported molasses, is located a little over a mile from the wharf, whence its daily supply is obtained. That supply has heretofore been maintained by trucks at great expense. Having witnessed the successful use of pipes for delivering oil, this firm resolved to try the experiment for molasses. Accordingly, a three-inch wrought iron pipe was laid, which, in the distance named, has an elevation of twenty-three feet and makes five right-angle bends. The operation is as follows: The hogsheads of molasses are emptied at the wharf into a large iron tank, connected with which is a Blake steam pump. This pump discharges into the three-inch wrought iron pipe before mentioned. The density of the molasses varies with the temperature of the atmosphere, and at times it is necessary to heat it to a temperature of 110 degrees, and in some cases a little water has to be added. The average daily work requires twenty-two double strokes of the pump per minute, delivering 2,000 gallons per hour. The difference between the capacity of the pump at that velocity and the amount of molasses actually delivered is ten per cent, showing that, owing to the density of the molasses, the pump does not fill to its full capacity. The experiment has proven a complete success, and a great saving in cost of transportation.

The largest block of artificial stone ever made in the one just finished and which is to form the foundation for Bartholdi's Statue of Liberty on Bedlos's Island in New York harbor. The stone is made of broken trap rock, sand, American and foreign cement mixed and water. Twenty thousand barrels of cement were used. The mixture for the stone was emptied into the "jacket," or mold, and then the surplus water was squeezed out. The stone rapidly hardened, and will now bear 100 tons to the square foot. It is only expected to bear up five tons to the square foot, but it will grow harder for the next two years. It has the color and gain of coarse gray sandstone. It is sunk 15 feet below the floor of the fort and rises 37 feet above it, has a base 91 feet square, is 67 feet square at the top, and is 52 feet and 10 inches high. On top of this will be erected the granite pedestal from which is to tower in all its magnificent proportions the colossal work of the great French sculptor. The casting of this mammoth monolith evidences the extent of modern progress in a signal way, especially when we imagine how, by this concrete process, Cheops could have so much more easily molded his pyramid, and the Russian Emperor been spared the great undertaking of removing to St. Petersburg the monster rock which supports the equestrian effigy of Peter the Great.

How the Flight of Bullets is Measured.—At a recent meeting of the New York Electrical Society, Mr. Henry A. Sinclair exhibited the instruments used for ascertaining the velocity of a projectile, and practically exhibited the working of the device by a test on the velocity of a pistol ball. Having first read the history of attempts in the past to solve the problem of measuring the velocities of very fast moving objects, such as bullets and shots, Mr. Sinclair set up a machine, and then, taking a Colt's revolver, fired a bullet into one end of a long coffin-shaped box. The little leaden pellet, having cut a fine wire stretched across the muzzle of the weapon, passed with great velocity over the four foot length of the box, and there met and cut another wire stretched in a gauze from across the box end. The cutting of the first-named wire let loose a falling rod, the cutting of the second wire started a pointed bolt, which nicked the falling rod, and then, by a ready measurement, the initial velocity of the bullet was made known. A 130-grain bullet, fired with 3½ grains of powder, gave a velocity of 207 feet per second, while another cartridge, having but 3 grains of powder, gave an initial rate of 156 feet per second.

To Measure the Contents of Cisterns.—A circular cistern 5 feet in diameter, holds for each foot in depth 4½ barrels; 8 feet in diameter, 12 barrels; 9 feet in diameter, 15 barrels; 10 feet in diameter, 18½ barrels. A square cistern, 5x5 feet, holds for each foot in depth 6 barrels; 6x6 feet, but 8½ barrels; 7x7 feet, 11½ barrels; 8x8 feet, 15½ barrels; 9x9 feet, 19½ barrels; 10x10 feet, 23¾ barrels.

To Destroy Vermin, etc.—A preparation made with one pound of soap (soft or hard) with an ounce of carbolic acid crystals dissolved in water will destroy vermin, itch, scurf and mange. The preparation given above should be diluted in warm water before being applied to the animal, and it will then not injure the hair.

Good Health.

Catarrh.

Editors Press:—Please publish a recipe for catarrh in your health columns and oblige a great many of the readers of the Press.—Thos. Haverty, *Telluride, Colorado.*

The above note has been accidentally delayed by being overlooked. We now hasten to answer. Catarrh is a very common complaint. Almost everybody is at times more or less afflicted with it. In many cases it produces no painful symptoms; in others it is attended with much suffering. The first symptoms of the disease becoming of a serious nature is a heaviness and perhaps pain in the base of the forehead. As the disease progresses there is redness of the eyes, dullness of hearing and ringing in the ears, tickling in the throat, and cough, foul breath, and finally decomposition of the facial bones, and loss of taste and smell.

A slight affection of catarrh may be induced by cold. Repeated colds may render it chronic. The seat of the disease is then located in the blood. In a cold or checked perspiration the effete vapors which pass off readily through the skin in health, are thrown back into the blood, cause inflammation and consequsnt decomposition of blood particles, just as a running sore decomposes the animal fiber about it. An outlet for this purulent matter from the blood is most readily found through the mucous membrane of the nose. If the general bodily health is cared for, and colds and exposure avoided, the symptoms will disappear; otherwise the discharge continues and increases until the blood becomes poisoned and the disease chronic.

Treatment—Contrary to the general opinion respecting this disease, it is among the most readily cured maladies, provided the patient can be placed under proper conditions, and can receive proper treatment. Among the necessary conditions, we mention as of the greatest importance, warm clothing, which should be carefully regulated according to the season of the year. As a general rule, flannel should be worn next the skin both summer and winter. The skin must be kept active and vigorous by tepid or cool baths or saline baths. The general health must be improved by a simple but nourishing diet, proper exercise, sufficient sleep, and attention to all matters pertaining to health. It is also of special importance that the diet should be of an unstimulating and unclogging character. Animal food should not be taken too largely, and condiments and rich food should be avoided altogether. The bowels should be kept loose and regular by the abundant use of fruit and coarse grains. The patient should be protected as much as possible from sudden changes of the temperature. This is best accomplished by not keeping too much indoors, but by hardening the skin and accustoming it to daily out-of-door exercise at all seasons of the year.

In addition to the above measures, much can be done toward effecting a cure by the use of proper local applications. When there is an abundant discharge, a cleansing lotion, followed by a lotion of an astringent character, should be used daily by means of the air atomizer. When the discharge is offensive, a disinfecting lotion should be used in addition to the cleansing and astringent lotions. When there is dryness of the membrane and scabs are formed, cleansing and stimulating lotions should be employed.

In all catarrhs, chronic or acute, long or short, a wise physician will do nothing to stop or repress the "flowings" or "runnings," but will use means to cause a greater activity of the liver, and prescribe an unstimulating and cooling diet, warmth and judicious exercise.

For ourselves we would give physic a wide berth. If we had a "flowing from," a catarrh, a cold, all of which mean precisely the same thing in nature and essence, we would let it flow, and thus have the system relieved of an enemy whose presence it will not tolerate. But there are three other things which may be done to very great advantage, because they would expedite the cure.

1. Keep the body very comfortably warm by all available means, especially the feet.

2. Take a good deal of exercise in the open air, to the extent of keeping up a very slight perspiration for several hours during the twenty-four.

3. Live on light, loosening, cooling food. Eat moderately of ordinary food, but partake freely of stewed fruits or ripe fruits.

A good gargle, if any is used, is a solution of salycilate of soda—a teaspoonful of the powder dissolved in a goblet of water.

The Diphtheria Cure Endorsed.

Editors Press:—I feel it my duty to speak of the value of a "cure for diphtheria" published in your paper of Jan. 3, 1885. The cure referred to consists in the use of liquid tar and turpentine burned on live coals.

I have tried it for a violent attack of cold. Two applications effected a cure. Other persons have been cured the same way, in my house. One day a little girl seven years old came in. She had had an attack of fever some weeks before, but still continued feeble, and had more or less fever daily. It was with some difficulty we could prevail on her to stay in the rooms to inhale the smoke. The result is, she has had no more fever, and has entirely recovered.

Another case is that of a 4-months'-old babe. She was attacked with fever, and, soon white patches were seen in her throat. A prompt application of the remedy relieved her immediately.

Now, I consider the information of a remedy of so much practical utility is worth ten years' subscription to the Press, and I wish the value of this simple remedy could be made known more generally. Robert S. Taylor.

Hanford, Cal.

Eat More Vegetables.—The vegetarians have done something in opening the eyes of sensible people, and of their doctors to these enormities of diet, says the London *Times*, and have even shown them that meals may become better and less monotonous by exchanging much of the meat for vegetables. Lentils, peas and all their kindred are almost as nourishing as animal food, and a cook will find plenty of palatable ways of dressing them. Rice, the food of a large fraction of the human race, is not half enough employed by us, except for the benefit of our children. Why is not more use made of maccaroni? No doubt, too, the vegetarians are right in denouncing "the present system of living chiefly on white bread and butter, alcohol, or even teakettle slops," as deteriorating to the constitution of our artisans and country laborers. A real service is done whenever these people can be shown how at no increase of cost they may vary and improve their food; and this the vegetarians can do, if only from their experience of different kinds of vegetable diet. But they must not expect the British artisan to agree with them altogether, though they draw up a frightful list of diseases and disasters to which carnivorous flesh is heir, and though they match this with another list of "leading men, strict vegetarians"—a list beginning with Prof. Newman and John Wesley and ending with "Rossean, Pythagoras, Borromeo."

Danger in Smelling-Salts.—A doctor who ought to know says that the practice of the wholesale use of smelling-salts, which came in with the universal fashion of carrying smelling-bottles, is sure to have its influence upon the olfactory nerves sooner or later, and will render the victim unable to distinguish cologne from assafœtida. More than all that, it causes headache, sore throats and red noses. The last argument will have its weight. The smelling-bottle must go.

Mental Activity and Physical Beauty.—A modern scientist has discovered that mental activity enhances physical beauty, thus controverting an old theory. It says: "A handsome man or woman who does nothing, but lives well, or self-indulgently, grows flabby, and all the fine lines of the features are lost; but the hard thinker has an admirable sculptor always at work keeping his fine lines in repair, and constantly going over his face to improve the original design."

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

VOLCANO.—Cor. Amador *Ledger*, March 21: Mr. Hopkins, one of the principal owners in the Acme mine, was up here on last Saturday, and is thinking about starting up the mine at the commencement of spring. Rock from three different parts of the mine was taken to San Francisco, and assayed respectively $140, $110 and $22 per ton. This appears to encourage the owners. The Gillick mine, located on Sutter creek about one mile below town, is considered by all mining experts to be the biggest kind of a bonanza. The mine consists of two parallel ledges about 40 ft apart, and each ledge is 3 ft in width. The mill owned by Mr. Gillick, situated on the opposite side of the creek, is at present undergoing repairs, and we understand the wheel will be finished at the beginning of next month, when a crushing will be immediately made. R. C. Downs and wife of Sutter Creek were in town on last Saturday. We understand that he intends to start up his mine in the beginning of spring. The St. Louis mine owned by Reed & Smith, and located at Irishtown, had a crushing one day last week and the rock paid on an average $16 per ton. A tunnel runs into the hill about 200 ft, at the end of which a shaft has been sunk to the depth of 150 ft, the rock taken from this shaft paid $22 per ton. There is also at the mouth of the tunnel another shaft, and the rock from this place paid over $25 per ton.

GOOD ROCK.—Amador *Sentinel*, March 21: Good rock is shown as coming from Stewart's Ligbthouse mine. The prospects appear very favorable here for a permanent mine. Charley Mitchell of Sutter is confident that he has the boss mine. We hope he has. It is situated just across the river in Calaveras county and is upon the main lead. There is continued good news from the Mammoth tunnel. They have now a hard, well-defined ledge of a good character of rock. The depth is 700 or 800 ft, and would indicate a large ore body in the river region. Messrs. Moon & McConnell have disposed of an interest in their mine, between the town and the river to John Steinberger, the latter to have the management of the working of the same. Mr. Steinberger can put money into the development of the property and it is presumed that he will do so. The St. Julian stamp continues pounding away, and does good work in helping to pay the expenses of prospecting the mine. The owners are talking of erecting a 5 or 10-stamp mill upon the property, it being possible to run a mill of that description almost as cheaply as the one they now have.

SUTTER CREEK.—There is talk about forming a partnership between some of the idle men about town and the Mahoney Mining Co. to work the mine, the company to furnish the material and the men the labor, the profits to be shared equally. This is the rumor; how it will turn out we shall have to wait and see. John A. Steinberger, one of the principal owners of the Amador Consolidated, was up last week for a few days looking after the mine; he left Thursday morning for Mexico, where he has charge of a coal mine. Dick Eden and Jack Truan are prospecting their claim, on which they have a sbaft 45 ft deep, with some very good looking rock carrying a large amount of sulphurets. The McIntyre mine is at a standstill, but will start up the first of May, when new machinery, consisting of an engine and hoisting works, will be set up, and the indications are that Mr. McIntyre will have a good paying mine before long.

A NEW QUARTZ MILL.—*Dispatch*, March 21: We are informed that Messrs. Morgan & Shugert, of the Amador Queen mine, will commence shipping up the necessary machinery in a few days for erecting a new 20-stamp quartz mill on their mine. They have been prospecting this mine for some time, and are now thoroughly satisfied that it will pay them to work it on a large scale. There is every indication now that it will prove to be a big paying institution.

Calaveras.

BIG MILL PROJECT.—*Mountain Echo*, March 21: It is reported—with how much truth we are not prepared to say—that a hundred stamp mill is to be erected on the Gold Cliff mine. The most incredulous man in the county can no longer doubt the permanency of the mining boom in this vicinity. We are informed that one day last week, a miner who was prospecting in a gulch near Duck Bar, on the Stanislaus river, found a piece of gold weighing a fraction over $80. A gentleman called at our office the other day and exhibited some exceedingly rich specimens of quartz which he said were extracted from a mine near French gulch, this county.

CAVE.—Calaveras *Chronicle*, March 21: A cave occurred in the Penobscot hydraulic mine, on Tunnel Ridge, the other day. The cave was not extensive, but the bank being very high the debris scattered considerably and the wind caused by the falling mass was powerful. Eight Chinamen were knocked down while beating a precipitate retreat, but no one was badly hurt.

Del Norte.

QUARTZ.—Del Norte *Record*, March 19: From all appearances it now seems that the several quartz mines in this immediate neighborhood are destined to amount to something in the near future. The quartz in which these mines abound is known to contain the precious metal in a reasonably fair proportion, and their position being of such easy access it is a thing to be wondered at that they have till now failed to attract foreign capital to bring about their fuller development. A company composed of Eastern men have the agency for Wiswell's Improved ore pulverizer and amalgamator combined (one of which machines is now on exhibition in San Francisco) has at last interested itself in one of these mines, and says that if the quartz will produce gold in an amount not less than three dollars a ton the company will have the necessary machinery on the ground inside of 60 days to vigorously carry on the works. The mine to which we refer is situated about a mile and a half east of the Bald Hills quartz mine, and is now and has been owned and prospected by Messrs. Dave Gordon and Jose Teran. These gentlemen were to bring in this week something over a thousand pounds of ore to be shipped below on the next steamer for the purpose of having it tested. They feel confident the ore will go far above three dollars a ton. They prospected the lode sufficiently last summer to satisfy them that there is an almost unlimited supply of ore, and that it can be placed on the surface at a cost not exceeding 50 cents a ton. In the absence of water facilties to run the machine an engine will here be used sbould the product of this thousand pounds of ore demonstrate to the satisfaction of the company the feasibility of putting up the works. We look with no small interest upon the test.

El Dorado.

GOOD FIND.—*Mountain Democrat*, March 19: In speaking with some gentlemen from Shingle Springs about "finds" in course gold, we were told that something like a month ago, M. S. Grainger of that place had picked up a piece weighing $1,515. This nugget was found near the surface on Mr. Granger's ranch. He had previously found pieces weighing from $100 to $300 in the same vicinity.

OLD HICKERY MINE.— — Ball, of Oakland, has been in Placerville the past week looking after his interests. He has concluded to resume work on the Old Hickery mine north of town, and prospect it to a greater depth. Mr. Ball says he intends to know what this mine is good for.

HENRY'S DIGGINGS.—Bradley has completed the work on the flume and ditch, and the water was turned in March 16th. The boys are all getting ready to work up their pay dirt. W. T. Armstrong has discovered and located a fine quartz ledge which prospects well.

Inyo.

MODOC CON.—Inyo *Independent*, March 19: Started drift from bottom of winze on the 10th. Southwest drift shows a strong ledge with occasional bunches of ore. Northwest drift shows from two and a half to three feet of clean ore. Amount of ore at the furnace and on the dumps, 134,000 pounds. The ore now being extracted will smelt without flux of any kind.

PROSPECTING.—Freeman and Coates are prospecting on their claim west of Bishop creek. They have no men employed and do not want any. No other prospecting is being done in this locality. Not enough work has yet been done to enable any one to determine what the value of the late discovery may be, nor even to prove if the ore will pay for working. Of course every one in Inyo county hopes Messrs. Freeman and Coates may find millions in it.

CASEY MINE.—At the Casey mine there is a very large quantity of ore in sight; at present Mr. Cook has but four men at work, but enough has been developed in the mine to determine the company to build a mill. On ground belonging to the company there is a vast quantity of low-grade ore that will go at least $20 per ton. A way will be found for working this ore.

BROCKMAN MINE.—There is reported to be a large quantity of ore in sight in the Brockman mine, north of Bishop creek, that contains 30 to 60 per cent copper and from $100 to $500 per ton in silver.

Mariposa.

SULPHURETS.—Mariposa *Gazette*, March 21: The ores in the Eureka mine at Hornitos, Mariposa county were thoroughly tested in 1883 by S. E. Holcomb and found to be a sulphuret proposition, and recommended the mine as such to Eastern capitalists. From this standpoint, Eastern investors have purchased this property and have erected thereon a new 10-stamp mill which will be in running order in a few days with all modern improvements to save sulphuret ores, which in early California mining were considered worthless, particularly in this county.

THE GRANT MINES.—There are scores of mines in this county with an unlimited quantity of rock that will pay over $13 per ton, with every facility for cheap working, but capitalists do not appear to want them. When the mines on the Grant are worked, however, the attention of mining men will be attracted towards Mariposa, and then our prospectors and mine owners will have a chance to either sell their claims or induce others to advance money with which to work them. Now that Donahue & Kelly have a perfect title to the Grant the working of it is only a matter of a little time, as those gentlemen are not the kind of business men to keep such a large property idle for the privilege of paying taxes on it. They desire to sell it, we are informed, as they know nothing of mining, and it ought not to be a hard matter to do when we consider the large number of developed mines on the property.

Modoc.

HAYDEN HILL.—Cor. Adin *Argus*, March 19: The Juniper arastras are to start up to-day, though it will be some time before the quartz mills will begin to grind. The "Golden Eagle" is still taking out ore on the east levels, and running a prospecting drift north in heretofore unprospected grounds. Billy McDonell is expected to arrive here in the near future and resume work on the "Don't Care" mine. The Harbet mine has suspended work for the present. The "Brush Hill" now owned and worked by Beckman & Vanderelst, is still producing considerable good ore. Jerry Rose has leased a portion of the "Golden Eagle" and is tunneling near the "Providence" line.

Mono.

OLD MAMMOTH DISTRICT.—Bodie *Free Press*, The Lisbon mine is opened by three tunnels, one 50 ft from the apex of ledge which runs northerly and southerly. Second tunnel 100 ft lower than the first and the third 100 ft still lower. Winze connects Nos. 1 and 2. Another winze is being sunk to the third tunnel and is now over 60 ft deep. Good ledge exposed in all averaging from 2 to 3½ ft. Free gold bearing quartz. They are now prepared to take out rock for a new 5-stamp mill to be erected the coming summer. Have already made some successful runs in arastras. Alpha tunnel shows good spots of ore. Chas. Albright is working the Foulk mine which makes a fine showing and some good ore on dump. Plenty of base ore of low grade in the district. Seven men wintered in the camp. From the Punch Bowl, 6 miles from Williams' ranch, snow continues to Mammoth, the average depth of which is about 3 ft. No sign of animal life anywhere. Snow ceases at Casa Diablo springs and Long Valley to the southward is clear as far as the eye can reach. Teams from Bishop Creek can get within 3 miles of Mammoth. Not a soul to be seen in the old town of Mammoth. Houses overthrown by wind, tables, chairs, beds, etc., in wild confusion. Roofs breaking and broken down under weight of snow; clanging doors and shattered windows showing the deserted interiors. The once lively streets are filled with broken odds and ends incident to a hasty departure. The old Mammoth mill battery and pan room has caved in upon the machinery. Office, stables, boarding houses are in good condition. An immense lot of wood lies piled at the foot of the tramway and mill. Mineral Park and Pine City present the same appearance as described above. The snow is from 4 to 5 ft deep, and on the big lake is 3 ft with 4 ft of ice. Boats of all kinds lie half buried on the banks. The west side of Mammoth hill is free from snow about two-thirds of the distance from the summit down.

A NEW DISCOVERY NEAR MONO LAKE.—Bodie *Free Press*, March 21: The Olsen mine, located and prospected by Uncle Dan Olsen, is a recent discovery which gives promise of a mine of considerable importance. It is situated in Jordan district on the northwest side of Callihan's canyon and about three miles from Mono Lake. Mr. Olsen has run a tunnel 75 ft in a westerly direction, the face of which is about 100 ft from the surface. There is a cross drift 25 ft—no walls. The formation is black clay and quartz carrying gold and silver with assays as high as $500 per ton and bears a close resemblance to the old Gold Hill diggings in early days. About 300 ft above the mouth of the tunnel the cropping is from 6 to 10 ft running in an easterly and westerly direction. Several other parties are prospecting in the neighborhood with good success thus far.

Nevada.

WASHINGTON DISTRICT.—Cor. Nevada *Transcript*, March 21: The Washington mining district is proving equal to the expectations of the most sanguine, and it is now generally conceded to be one of the richest gold-bearing sections in the State. The general average of the rock will work by mill process, from $8 to $20 per ton, which with the strength and number of the veins is a sure indication of the wealth of the district. In all cases the ore has steadily increased in value as depth has been attained and the opinion largely prevails among men of acknowledged capacity in this branch of industry, that owing to the continuity of the ledges and the extreme width of the mineral belt there will eventually be as deep mining in this district as in any other part of the State. During the past few days I personally visited nearly if not quite all of the mines, both developed and undeveloped, within certain boundaries in this district. The first mine I visited was the IXL, located at the head of Diamond creek. Their ledge is small, but well defined, as gold could be seen in almost every piece of rock taken from the dump. The company have a number one five-stamp mill running steadily, with all the improvements for saving the gold, sulphurets, etc. John Deardoff is their present superintendent. The old Last Chance mine, considered to be one of the richest in the district, lies just to the north of the IXL, and at present is idle, though work is expected to be started up on it some time this summer. This property belongs to Messrs. Webber and Haggin of San Francisco, owners of the Yuba mine. At the Cornucopia and Secret Treasure they are working night and day sinking their shaft. They have it now down about 70 feet, carrying a four-foot vein of good character rock, as gold can be freely seen in many pieces taken from the dump pile. Their new mill is not running at present, but it is not for the want of ore to work as they have in the mill and on the dumps from 100 to 200 tons ready for crushing. At the Yuba mine, 700 feet south from the mill, they are down 200 feet. That is their lowest level. At that point they have a 12-foot vein, and a large portion of the rock shows well in free gold and galena. Mr. Webber informs me that the mine never looked as well as at the present time. An additional ten stamps is to be added to the mill as soon as it can be done conveniently, making 25 in all. At the Eagle Bird, on the 200-foot level the ledge is from 15 to 18 feet wide and all good paying ore, and a good deal of it shows rich in free gold. It is said that 20 more stamps will be added to the mill during the summer, making 40 in all. The Waters mine is located about 1,000 feet above the Eagle Bird. It has a tunnel in on the ledge about 300 feet, carrying a vein of from three to four feet thick which shows well in sulphurets and free gold. Mr. Waters has out about 150 tons, which will average at the lowest calculation $8 per ton. A Huntington mill with a capacity of from 12 to 14 tons per day is to be erected immediately on the mine. All of the material for building is now on the ground, with the exception of the machinery and the mill itself, and the groundwork is being prepared as fast as workmen can be found to do it. At the Lindsay mine, the oldest in the district, they have now at their upper works a vein about six feet wide and all good rock.

NEW DRIFTING MINING ENTERPRISE.—Nevada *Transcript*: R. P. Denoon, formerly superintendent of the Derbec drift mine, arrived here night before last from San Francisco and yesterday morning left for North Bloomfield. He has leased a large tract of gravel at the latter town and will at once begin working the same by the drifting process. A comparatively small number of men will be employed at first, but the force will be increased as fast as the ground is opened and the circumstances permit. This enterprise may develop into a very extensive one, and if it does it will be a great thing for North Bloomfield and vicinity, as employment will be given to many men who have been idle since the suspension of hydraulic mining at that point.

Placer.

WORK AT HOTALING.—Placer *Argus*, March 21: During the past winter prospecting and mining have been steadily prosecuted at the California Iron and Steel Co.'s works at Hotaling, resulting in the discovery and opening up of what bids fair to be the most important body of ore yet uncovered in this State. At the present workings a shaft has been sunk 50 feet through solid ore, which was still in ore when sinking was stopped and drifting and crosscutting commenced. At present writing the two drifts are in fine ore, one having passed through 35 feet of high-grade ore, assays from which show 68 per cent iron. Ore is being hoisted as rapidly as possible with a view of starting a prolonged blast as soon as raw material is accumulated sufficient to run the furnace for a year.

FOREST HILL.—Placer *Argus*, March 19: The dry weather continues and ditches are getting lower, so that water consumers look somewhat dejected at the prospect of a short season for mining. It is reported that rich gravel has been struck at the Mayflower mine. Everybody here sincerely hopes the report is true, as it may be the cause of other mines being developed on the Divide. The company is in want of several good drift miners.

San Bernardino.

CALICO NOTES.—*Print*, March 22: The Sue mine is taking out 7 or 8 tons of good ore daily and hauling it to the Waterman mill. We were informed that a rich deposit of ore was recently struck in the lower workings of the mine. The little mill at Alvord is to be enlarged to a 5-stamp. The machinery has arrived and was loaded on large freight wagons yesterday. The sampling works are not receiving ore in as large quantities and as regularly as was at first anticipated. Recently 70 tons of ore were milled by the Waterman mill with most satisfactory results. Twenty or thirty men have recently been employed on the Garfield and Occidental mines which makes the present force about 45 or 50. A great many chloriders and unemployed miners have left Calico district recently to prospect in the eastern and northeastern part of the county. The other day we were shown, by Wm. Robinson, some good looking base ore from the new mines about 10 miles from Soda Lake, that assays over 100 ounces to the ton. Mr. Robinson will go out there shortly to see if the ore exists in paying quantities, and corroborates the statements of parties prospecting in that locality. There are about 3,000 tons of second-class ore from the Garfield and Occidental mines ready to be reduced at Barber's mill. About 62 tons have just been reduced at this mill from the Humbug mine, the returns being satisfactory. Also 62 tons from the Golconda are waiting to be milled.

PROVIDENCE MINES.—Cor. Calico *Print*, March 22: In my last I intimated that the Bonanza King mine would likely start up soon again as a $3 per diem camp. My predictions have been fully justified. The mine started up last Sunday with 15 miners and at date of writing there are 30 working in the mine, miners are put on as fast as they arrive and it is likely the Bonanza King Co. alone will work 85 to 100 men. The mine is said to look better than ever before, at any rate your correspondent saw as good ore, piled up on the dumps to-day as it bas had since the commencement of the working of the mine. The owners of the mine claim to have cut the miners wages with reluctance, but owing to the very low prices of bullion they were compelled to do so. It is quite evident that it is their intention to push the working of the mines more than ever before. The mill will likely start up again whenever the mine will have sufficient ore ahead. The president and some of the principal owners have been here for the past week, and everything is being arranged for the more complete development of the Bonanza King Consolidated Mining Co's. properties. You may confidently expect to see a larger output of bullion than ever before. The Kerr, Belle McGillroy and Mozart group of mines are all being worked and they are all showing good ore bodies. It was stated on good authority to-day, that the Belle McGillroy and Mozart group of mines have been bonded to a Pennsylvania Syndicate represented here by Mr. A. G. Hoyt a nephew of ex-Governor Hoyt of that State. Miners wages are $3 per day, and board $7 per week.

Shasta.

GOLD AND SILVER.—Shasta County *Democrat*, March 18: Dale & Fife of the Silver King mine are getting ready to commence shipping ore. Dan O'Neal has struck another rich body of ore in the Florida and is now putting it through his new arastra. We are told that fully 100 men are prospecting in the mountain range between Iron mountain and the Sacramento river. F. B. Simonds Sr. is up on Backbone prospecting. He has found two claims that prospect first rate in free gold. Tom Green was in town Monday and deposited with the bank a chunk of gold bullion weighing 7½ pounds. This is one of Tom's little cleanups. Our local capitalists are over looking the best-paying investments that are open to practical business men of the county in our rich and undeveloped mines. Development is all that our mines need to yield thousands. Tucker & Keifer, who are sinking on the Monarch near the Silver King were compelled last week at a depth of 20 ft to stop work for a few days on account of too much water. They will resume work as soon as they can put in a steam pump. Mr. D. McCarty, section boss, has struck what appears to be a big silver ledge on the west side of the river near the mouth of Spring creek. We have seen samples of the ore that look splendid and closely resemble the rich ore of the Silver King. Kempton of Salt creek for several days has been running his cannon-ball mill on ore hauled from the Fair View mine, situated on the ridge west of the old Hall reservoir. Ore from this mine already crushed has averaged over $100 per ton. Lowrey & Brincard are finding good ore in the shaft they are sinking on the Silver Queen, the first extension north of the Silver King. About two weeks ago O. P. Whitton and Bob Small struck a fine free gold-bearing quartz ledge on the mountain between Squaw creek and Backbone, about a mile and a half from Jack Coonant's rich ledge. It appears to be an extension of the same vein much higher on the mountain. We are reliably informed that 800 feet of the croppings show free gold and prospect big. The shaft on the Pioneer mine, on the Silver King lead, is now down about 20 ft, at which depth fine looking ore was struck. The vein proper is 4 ft wide and dips about 30 degrees east. The owners of this mine feel sanguine that it will develop as good property as the Silver King. Water will soon compel them to put in a pump. From the many samples of gold and silver ores that are daily brought to this office, judging from their character and the formation they are in, we can't help feeling confident that good work will this summer develop a number of splendid mines within a radius of from 10 to 20 miles of Redding. It is hardly possible that all these fine prospects will fail; some of them must turn out to be good property. Every day brings something new that is very encouraging.

TO BE WORKED.—Shasta *Courier*, March 21: The owners of the once renowned, and rich mine known as the Bunker Hill mine, near the Middle Creek depot, are making extensive arrangements to have it thoroughly worked again, and already have a force of men at work. It is to be hoped it will pay as rich as it did 20 years ago when gold was taken out by the bucketful.

Sierra

NEW QUARTZ MILL.—*Mountain-Messenger*, March 21: Supervisor A. C. Busch, P. Deidesheimer,

and the other owners of the Young America quartz mine, located about four miles above Sierra City, have decided to erect a ten-stamp mill upon the property this summer. They have spent the past year in thoroughly developing the ledge, and now have a strong vein exposed for a distance of 300 feet in the lower tunnel, with a backing of 150 feet below the tunnel next above, showing quartz enough to run a ten-stamp mill for more than a year. A tunnel still lower has been started. Samples of the rock we have seen are very rich, and the whole ledge wherever it has been exposed, shows a fine quality of ore, with a uniform prospect such as is seldom seen. The iron-work of the new mill will be furnished by Taylor & Forbes of the Downieville foundry. The stamps for the mill will weigh 750 pounds, and the frame work will be so planned that more stamps can be put in as required. The motive power will be water, of which there is a sufficient supply, and a Pelton wheel.

GOOD SHOWING.—During the past three weeks the Bald Mountain Co., Forest City, have cleaned up 224. 189 and 247¾—660¾ ounces; and the Bald Mt. Extension, 50. 87, 120½—257 ounces, a total of 918¼ or about $17,079.45. an average yield per week of $5 693.15. Who says Forest City is on the decline can't be posted well in the underground workings of her mines. There is enough good-paying quartz in sight at the ledge of Jerome York to last about a year. It costs $1.50 to mine and $1 per ton to mill the ore, leaving a fair margin for profit. The lower tunnel of Gold Bluff is now in over 900 feet and has to be run only about 600 feet further to be under the upper workings. It is thought the ledge will be reached at the farthest by July, and perhaps before. Two shifts are at work and the rock is good.

Siskiyou.

PICK AND PAN.—Yreka *Union*, March 21: The Boulder creek quartz mill is idle, and has been attached for debts. As soon as litigation ceases it will no doubt be started. The rich Bonanza mine on Indian creek has been bonded by local capitalists. Terms unknown. Four years ago the owners refused $60,000 for the property. Several mining experts from below are in the county. We told you all the time we had 'em, and rich and permanent ones at that. Our mines will compare with any in the State. Mr. A. H. Denney has bonded the Fortune mine at Callahan and will soon start the pumps at work. The Fortune adjoins the Montezuma on the south branch of Scott river, and is excellent property. The cost of placing and operating the electric lights in William McConnell's Klamath river claim last year did not cost within $600 of the amount expended for pitch-wood the year previous. Those who are lighting their claims with pitch fires should study economy.

SAWYER'S BAR.—From Mr. J. J. Curran, who arrived Monday from Sawyer's Bar, we learn that the miners on Salmon are complaining of the scarcity of water, and that hydraulic miners are all idle. At the Uncle Sam mine they have taken out some very rich rock, but there is no water to crush it with. The Russian Company who own the Red Hill claim, are digging a ditch from the Little North Fork, a distance of 2 miles, to bring water on to the claim. A short time since they took out 27 ounces in one week, Chris. Barry & Co. are ground-sluicing, but have not bottomed up as yet. The Gus Mohr claim will be drifted this season. Mr. Hickey is waiting for water to commence operations in his hydraulic mine. Klein & Bigelow are cleaning out their ditches preparatory to commencing operations in the river. At the Klamath mine they are taking rich rock, and the cleanup this month is expected to be fullly up to that of last. At the Black Bear they are waiting for the arrival of Mr. Daggett, when it is expect that active operations will be commenced. Mr. Jas. Kean, at Evening Star, is crushing rock, but no cleanup has as yet been made, and no estimate can be made as to the final result.

Trinity.

PROVING GOOD.—Trinity *Journal*, March 21: The ledge recently found on Mule creek, near Minersville, by Lupee and O'Shea, and in which others are interested, has every indication of proving to be way-up. A shaft has been sunk on it to a depth of 20 feet, and the ledge at this depth has widened to three feet, the ore showing free gold. "After All" is the name given the mine.

Tuolumne.

POCKET.—Tuolumne *Independent*: John Morris and Mike Page and brother have been unloading a rich pocket in the old Bauli claim, at Brown's Flat. Page is working the claim on shares for Morris who was taken sick at the time of the strike. One piece of quartz was believed to contain $500 worth of gold. It is estimated that they have taken out near $5,000, with more in sight. Rumor has it, that Messrs. Shine and Oliver took 90 pounds of gold ($18,000) to the city, last week, being half of the yield of the pocket struck by them, recently, at Brown's Flat. We learn that the Chrystaline quartz mine, near Jamestown, is proving immensely rich. A little over two weeks ago a great strike was made. Report says that over $100,000 is in sight, and that the chute is so rich that a pick cannot be struck into the rock without striking gold. The mine is on the Mother lode, between the Alabama and Harris mines.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, March 21: Work is being pushed at the above mine, and the managers intend to find an ore body if there is one to be found. On the 2900 level the north drift has been advanced 40 feet during the past week. On the 3000 they are driving a north lateral, just skimming the ledge, and are in a fine, heavy clay formation. They will cross-cut after advancing further.

OPHIR.—On the 500 level have been engaged in cutting a drain and retimbering. The drift which is being run north from the west drift on this level is a joint Mexican and Union Con. drift.

OVERMAN.—Two shifts have been put to work in the Overman mine. The old Lambert tunnel has been cleaned out, and will be driven in to strike the croppings on a level with the railroad track.

CROWN POINT AND BELCHER.—At the Belcher and Crown Point the usual amount of low grade ore is being extracted from the old upper levels and sent to the Carson river mills.

C. AND C. SHAFT.—Ore is being extracted from the 1200 level under the Jones contract, and is shipped to the Eureka mill.

SAVAGE.—Nothing of importance is being done in the Savage, but they are waiting for the result in Norcross.

GOULD AND CURRY.—The usual work is being done, but nothing of importance has occurred during the week.

CHOLLAR.—They are running a drift in west on the 2800 level, and are in good looking ground.

Bernice District.

DEVELOPING.—Cor. Reno *Gazette*, March 16: Mr. Williams, superintendent of the Golden Crown mine and mill, started for Lovelock this morning with nine bars of fine bullion of the value of $10,320, the result of 25 days working of the mill on ores from the Golden Crown mine. The Williams, or lower tunnel, has been run 110 feet during the past month, and on this level was found the best body of ore that has yet been found in this district, some of the ore assaying $1,900 to the ton. The ore on the lower levels has become slightly base and requires five hours' roasting, but the increase in the cost of roasting over free milling is richly compensated for in the increase in the value of the ore. Wood is delivered at the mill for $4 per cord and salt for $10 per ton. A winze has been started in the lower tunnel to connect with a tunnel that is to cut the ledge at 500 feet in depth. The bullion has averaged so far over 900 fine. On the Wild Goose mine four men are at work taking out ore; 175 tons of ore worked at the mill from this mine, yielded $130 per ton. M. W. Hart is at work taking out ore on the Silver Ridge mine. The Mine is looking well and its ores work about $125 per ton. This district needs a ten-stamp mill, as Williams cannot offer any inducements to work outside ores, there being more profit to him in working his own ores, and he has plenty in sight to run the mill steadily. Arrangements are being made to erect a ten-stamp mill this summer, which will materially assist in the shipment of bullion from this district, and the outlook is good for a prosperous camp here for years to come. In Granite district, four miles south of here, D. L. Healy has sold his half interest in the Silver Wave mine to Mr. Hoofer, a merchant from Austin, for $2,000, and I understand that they intend to put on a small force of men. As soon as the weather gets a little warmer there will be considerable prospecting done, as nearly all that have tried their hand have succeeded in getting good results.

Columbus District.

MOUNT DIABLO.—*True Fissure*, March 22: The west drift on the sixth level is in 179 ft, and the north crosscut from this drift is in 15 ft. The stope above the west drift on the fifth level shows a wide ledge formation and is yielding considerable $55 ore. The west drift, between the fourth and fifth levels above this stope, shows 18 inches of $80 ore, A little ore of good grade is being taken from the west drift on the third level. The intermediate, between the third and fourth levels and east of the shaft, is giving a little ore of fine grade. The intermediate, east of the shaft between the second and third levels, shows a small streak of rich ore. The stope west of the shaft between these levels, does not look so well but is giving some ore of fair grade. A little ore is being taken from seve al places on the second level, also from the first level, and from the intermediates between the first and second levels. A bullion shipment of $10,591.43 was made on the 15th instant.

Eureka District.

PRODUCING PROPERTIES.—*Sentinel*, March 21: There has been little or no change in the mining situation in Eureka district during the past week. Some 80 men are working in the Eureka Con. mine, and ore is being extracted from the second, fourth, seventh, eighth and twelfth levels. Altogether, the mine is looking and producing well. During the past five days 259 tons of ore have been shipped to the company's reduction works. It is the general belief that more miners will find employment in the property just as soon as the new reduction works are completed and operations begun. As it is now the bins are glutted with ore, and to extract more than at present would only incur extra handling and unnecessary expense. The furnace is expected from San Francisco during the coming week, and Supt. Robbins will probably have it in full blast within a fortnight after its arrival. Many of the smaller mining properties of the district are looking and yielding well. The fact that more custom ores are being shipped to the Eureka Con. and Richmond furnaces than ever before speaks well. This is owing to many who have for years been waiting for capitalists to come in and purchase their properties going to work on their own account. In several cases the merits of properties are exceeding the anticipations of their owners. On Adams Hill are several mines from which good ore is being extracted at a depth of 30 and 40 ft. What there is at greater depth is hard to forecast, but inasmuch as the character of that section is somewhat similar, geologically, to that of Ruby Hill, whereon are the famous Richmond and Eureka properties, it is safe to predict a steady yield from there for many years to come. The Silver Lick is located there, and from it good ore is being extracted. The leasers of it have shipped during the past six days to the Richmond furnaces for reduction 56 tons. The Silver West, also located there, sent during the same time to the same works 17 tons. The Lone Pine made a shipment of 9 tons, and the Bowman shipped 7 tons to the Eureka Con. furnaces. The Lord Byron on Prospect mountain continues its output of ore, which works well. During the last week the company shipped to the Richmond works 47 tons. The Maryland mine of Silverado made a shipment of 4¼ tons, and 9 tons, which will work up the in hundreds, were brought in from the Reveille district yesterday. The Silver Connor mine is also among the producing properties, and yesterday a good-sized load of ore was taken to the Eureka Con. furnaces. The Albion also made a shipment Thursday to the Eureka Con. furnaces of 8 tons.

ARIZONA.

THE OLD DOMINION CO.—*Silver Belt*, March 20: On the first of this week our community was greatly surprised at the announcement of the suspension of the firm of Pope, Cole & Co., of Baltimore, the financial agents of the Old Dominion Copper Co., whose works are in this place. The firm was known to be strong and the wonder was how a house of its commercial standing could be forced to suspend, but this is easily accounted for by the large quantities of metal which they had to carry, and were unable to immediately realize from by reason of a glutted and falling market. The firm, we learn, will pay dollar for dollar and have a handsome surplus, but what more nearly concerns this mining district is a question of payment of last months' indebtedness, for which checks were given, and as is customary, were cashed by several of our merchants. Some of these checks have already been paid and Supt. Trippel is assured by telegrams that all obligations will be speedily met, and that a special agent of the assignee of Pope, Cole & Co., now on his way to Globe, will pay all indebtedness of the company not otherwise provided for. In order to reduce expenses, some of the development work in the mine may be temporarily suspended, but the ordinary work of mining and smelting will continue.

COLORADO.

GENERAL NOTES.—Georgetown *Courier*, March 19: The Corry City mine shipped 15 tons of ore last Monday. The Colorado Central mine paid a dividend last Monday. The Daniel Peters is producing 457-ounce ore. Second-class 134 ounces. The cross-cut tunnel has nearly reached the main shaft on the Summit. Arnold & Co. are working the Plebeian lode on Leavenworth mountain, on 276-ounce ore. Matthews & Webb have commenced the foundation of their concentrating works at Idaho Springs. G. W. Rockwell milled five tons of Swamp Angel ore last week, which returned 46 ounces silver and 2-10 ounces gold. Joseph Pirot, on the Free America had a mill run of over five tons of ore last week the first-class milling 96 ounces per ton. Over 30 tons of ore was brought down from the Terrible last week. The returns showed from 80 to 150 ounces silver per ton. The Cooper lease on the Polar Star Extension east is keeping up a steady production. A large amount of unassorted ore is stored in the ore house. The lessees on the Owasco, Brown mountain, are taking out some excellent ore. One party is working on a 600-ounce streak, and another is taking out rich "sulphurets." Some big shipments were made from the Seven-Thirty mine last week. About 30 tons were treated at the at the Public Ore Market, the ore ranging from 90 to 600 ounces to the ton. McNulty & Co. are working on a streak of 150-ounce ore from five to six inches thick, in the breast of the lower Junction adit. They intend to make a shipment of about ten tons in a few days. During the month of February 47 cars of ore were shipped from Georgetown, 35 of which went to Denver, 7 to Argo, 4 to Golden and 1 to Idaho. There were nearly 320 tons, valued at over $70,000. McVeaty & Co. are so well satisfied with the financial worth of the Fred. Rogers that they have leased additional ground below their present workings. It is reported that they have increased their force, and have over a dozen men employed. They are making some excellent shipments, and from one to six inches of ore is shown in different portions of their ground. George Mills informs us of the recent strike made on his property, the Carbon lode, Red Elephant mountain. About 12 inches of mineralized quartz and a nice streak of solid ore has been encountered in the cross-cut run from the hanging to the foot-wall. Between 20 and 24 inches of mineralized quartz and two inches of solid ore is shown in the shaft. Mr. Thomas Cunningham, superintendent of the Horseshoe Mining Company, in Peru district, Summit county, just over Argentine Pass, was in town yesterday. He reports the Queen mine as looking better than ever before. The shaft which has been sunk from the tunnel level has reached the depth of 75 feet, and drifts have been run each way for a distance of 30 feet on the vein, showing a continuous streak of sulphurets from two to four inches in thickness. There are about 12 tons of ore on hand, which has been taken out by development only. No stoping has yet been done. As soon as the trail is opened to Georgetown for a pack train, a shipment will be made.

IDAHO.

LAVA DISTRICT.—Wood River *Times*, March 18: A gentleman just arrived from Champagne creek, in Lava mining district, reports quite a number of prospectors arriving there, and scattered about the hills, which are hardly bare. A fourth lot of ore is ready for shipment, and it is the richest yet shipped from the district. The first shipment from that camp arrived here about the middle of last July, and returned 485 ounces silver per ton, with some gold; no lead. The second was also sampled at the Hailey sampler, and sold at the rate of 633 ounces per ton. The third lot—of four tons—was shipped to Salt Lake City last December, and sampled 814 ounces per ton. The fourth lot on the dump ready for shipment, is said to be much the richest of any. A company is being organized in the East to purchase the Martin and adjoining mines and erect a 20-stamp mill there this summer. There is no doubt but that this promising district is at last coming to the front.

MONTANA.

RICH PROSPECTS NEAR HELENA.—Helena *Independent*, March 18: On January 8th, Messrs. Wm. Butler and James Russell located on the east side of Mount Helena the Butler lode, a relocation of the Silver Belle lode, and realized their fullest hopes in striking it rich. They have a shaft on the claim 40 ft deep, and have struck a claim that is 9 ft between walls. Three and one-half ft of the vein assays in silver and gold $122.50 per ton, and the balance will average as per assay $26. The discovery of this and other lodes within the past few days in sight of Helena is of no small consequence to our city, and it is not unlikely that in a short time Helena will hear the toot of the mill whistles and the hammering of numerous quartz stamps.

THE ANACONDA COMPANY.—*Inter-Mountain*, March 18: The Anaconda Company is now working between 600 and 700 tons of ore per day, and shipping daily almost 100 tons of copper matte; but not content with present facilities, it is also preparing for the erection of a second large concentrator a mile below the present plant and grading for a railroad for the transportation of ore and concentrates. This is a cheering prospect. Taking into consideration its wood contracts, the Anaconda Company is now giving employment to 1,500 men in this and Deer Lodge counties and undoubtedly it supports in Butte and Anaconda fully 5,000 people. Thus is afforded some idea of the immensity and the beneficial results of the Anaconda Company's operations. That such a concern could exist except by adherence to the strictest business principles and under the direction of a master of finance like Mr. Haggin, aided by capable lieutenants, is absurd.

THE STEVENS.—*Inter-Mountain*, March 18: The record of the Stevens as a steady producer of pay ore is being fully maintained. The daily product from the lower level is about 20 tons, and its average assay value in silver and gold $40. Last month the shipments were considerably over 500 tons of ore which was worked. At the mine there is also an extracted reserve of about 500 tons of $25 rock, and at the mill about 1,000 tons more of the same grade. This ore, though of a somewhat low grade, will pay for milling. It was taken from the lower west level while drifting for the richer shoot which now looks so well. The supply of $40 ore is not great, and it is probable that within the next two months deeper sinking will be required, but it is likely that Judge Davis will decide not to incur further expenses for dead work at present, as in other mines he has plenty of available ore to keep the mill supplied. The product of the Stevens is treated at the Silver Bow mill, of which R. B. Wallace No. 1, its former superintendent, is again in charge.

NEW MEXICO.

STRIKE.—A rich gold strike is reported on Cherry creek in the Burros. The old wagon road crosses the lead where the gold was found. Several men are now at work on the property. James St. Clair has made a strike of $500 ore on the Big and Little Colorado mines, on Chloride Flat. The vein is eight inches wide. The ore carries brittle silver. Several tons of ore have already been taken out. "Rusty" Holman is jubilant over a strike made in the Gunsight in Chloride Flat, on the Sherman belt. He says that the slate, of which there is a large quantity, will average $25, and that there is a small streak of mineral through the same which assay $2,000. A two-car shipment of ore from the Great American mine in the Swisshelm mountains last week netted the company $3,300. A force of 20 men is steadily engaged in taking out good ore from this property. There is about 2,000 tons of what is termed low-grade upon the dumps awaiting the erection of a mill at the property. During the past two weeks there has been shipped from Whitewater 13 cars of iron ore to the Benson smelter. It was produced by the Santa Rita mine. There was also shipped one carload of high-grade ore from Smith, Tower & Co.'s mine, at Georgetown, to the Socorro smelter, and one car of concentrates, from McGregor Bros. mill, at Georgetown, to the Socorro smelter. A test made of the ore sent to the Gold Hill by Black & Parks, to be worked at Pinos Altos, shows that the average grade of ore will pay very well to ship from this camp. A sack was picked out of the shipment by Col. H. H. Carpenter, which was believed to be an average, and it returned $77.77. A rich gold strike was made on Whiskey creek, about eight miles from this city, on Sunday last by Messrs. Matt. Rosecrans and L. R. Gordon, who located Harry Garvey in for one-third. The ledge is about 12 inches wide, with from one to two inches of exceedingly rich gold quartz, specimens of which are very fine. Several men were immediately put to work to develop the property, when the true merits of the strike will soon be ascertained. The specimens created quite a sensation on the streets. Everybody was talking of the new strike. No other mineral seems to create so much excitement as free gold.

OREGON.

PLACER AND LEDGE.—Jacksonville *Times*, Mar. 21: Howard & Wakefield are at work in some mines near the mouth of Slate creek and are doing well. Thos. P. Kahler is sinking down on his quartz mine near Rogue river and securing excellent prospects. L. Martin of Ashland, who bought a 40-acre tract of L. Applegate last year, has found a ledge of quartz on it. He has sent samples of the ore to Portland for assay. Mr. Knapp, who took the contract for sinking a shaft on the Enterprise Co.'s ground in this place, is making excellent progress. He is an old miner and understands his business. Abrahm, Levens & Co. have rented what is known as the Grand Applegate mines to a company composed of J. N. Casteel, Chas. Nail and Jas. Wright. The ground has been worked for sometime past by Chinese. The continued pleasant weather has dissipated all hopes for an extended run and most of the miners are cleaning up. Some of them have no water at all, while others will not be able to clean up this season's work unless timely rains intervene. A flourishing mining camp has sprung up on Wagner creek and considerable gold is being taken out there. Garvin & Lewis, who are mining in the bed of the creek, have struck favorable prospects. Neil Bros., who took out good pay last season, are doing very well and doubtless have one of the best claims. Elliott & Snyder also have good diggings. Torrey & Hubbard of Medford are getting down to pay dirt, with favorable results. Noah Allen's claim is the lowest on the creek and Messrs. Anderson, Stephenson and Brown are at work just above him. Six claims in all are being worked. The great drawback there is the depth to bedrock and the numerous boulders, which necessitate the use of derricks.

UTAH.

REVIEW.—Salt Lake *Tribune*, March 20: The clear warm weather stays with us remarkably well; but the movements of metals remains light compared with last year's product, the chief falling off being accounted for in the non-production of the Horn Silver. The receipt of bullion and ore in this city during the week ending March 18th, inclusive, were as follows: Bullion, $79,422.65; ore, $9,950; total, $89,372 65. Product of the week previous, bullion, $39,998.36; ore, $8,640.56. The Ontario produced during the week 73 bars of bullion, $54,802.65; a total yield for this year to date, of $360,397.38. The Ontario is on a solid basis, and all is going on well with it. The Silver Reef district yielded during the week $6,420 in silver, of which the Stormont furnished two bars, valued at $3,450, and the Christy two bars, $2,970. The product of the Hanauer smelter since its starting up anew on the 11th was seven cars of bullion, $18,200. The ore receipts were $2,500 from the Crescent; $4,800 from the Honerine at Stockton, Utah, and $2,650 of Wood River ores.

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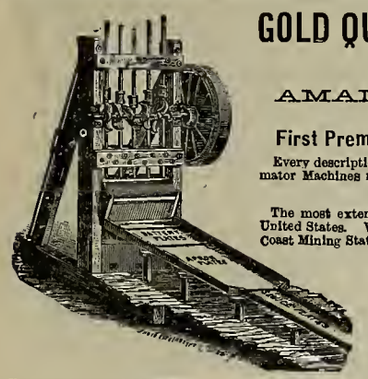

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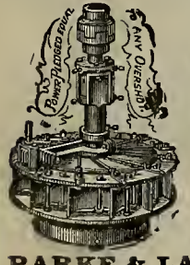

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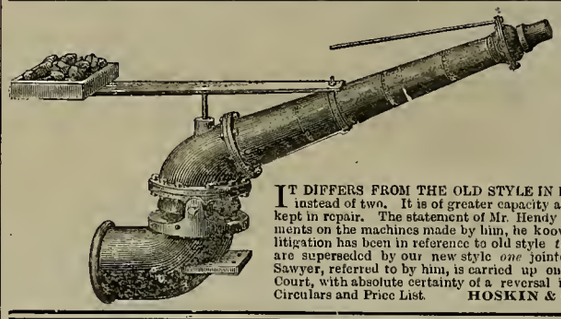

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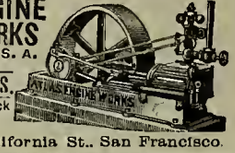

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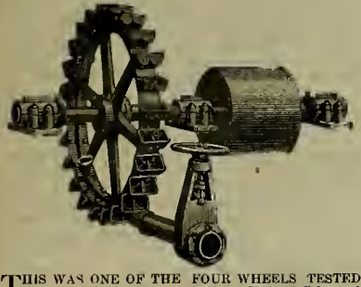

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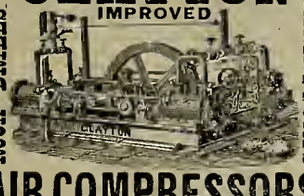

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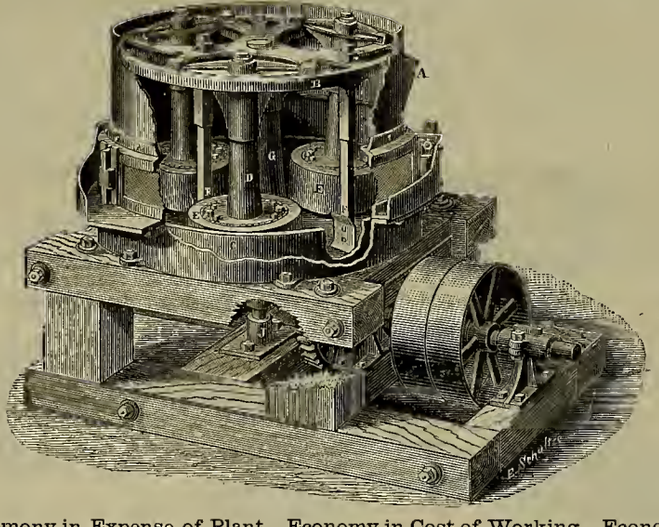

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The Pacific Coast Labor Convention.

Resolutions and Principles.

During last week the delegates to the Pacific Coast Trade and Labor Convention met in this city to discuss the matters concerning the labor question on the coast. The meetings were secret, and on their conclusion the following report of the proceedings was given to the press:

For three nights the convention of the trades and labor organizations of the Pacific coast has been in executive session debating the resolutions which are finally put forth to the public as embodying the line of action which they propose to follow in the future, and to secure the carrying into effect of which an organizing committee has been appointed and ample funds provided. Upon each of the subjoined resolutions the debate was earnest and long continued, and when carried they were adopted unanimously. The resolutions not adopted are not given to the press. Those adopted and found below summarize the work of the convention. Upon each resolution means have been provided to carry them into execution. The convention having been called to unify labor and discuss "hard times," the following resolutions were carried:

Hard Times.

Resolved, That in the opinion of this convention "hard times" are the result of a monopolization by non-producers of the natural resources, the tools of production and the medium of exchange, and must occur periodically until these monopolies are abolished.

Resolved, That the remedy for "hard times" can only be ascertained by the education of the producing classes of shop and farm, and, when found, can only be put in practice by their organization and federation. [Proposed by J. J. McClimont of Colorado].

The Grangers.

Resolved, That this convention is of the opinion that the agricultural classes represented here by the Grangers' organization, which pursues an active propaganda on the lines of practical co-operation, dispensing with middle-men, and which is composed of the producers on farm and field, are necessary and important factors in the solution of the labor question.

Resolved, That as representing the workers of the cities and towns, we extend to them the hand of fellowship and pledge them fraternal aid. [Proposed by J. J. Martin of San Francisco.]

Resolved, By the representatives of the Grangers, on behalf of the Patrons of Husbandry represented in this convention, we pledge to the organized labor of the cities and towns our good will, our friendship and our assistance in the work of organization and education. [Proposed by E. Kelsey, of the Grangers.]

Declaration of Principles.

Resolved, That, revoicing the words of such menas Louis Blanc and Victor Hugo of France, Karl Marx and William Liebknecht of Germany, H. M. Hyndman and William Morris of England, Bronterre O'Brien and Michael Davitt of Ireland, Piy Margal of Spain, Andreas Schen of Austria, and John Swinton, Joseph R. Buchanan and Henry Appleton of America, we, the Pacific Coast Congress of Trades and Labor Organizations, unanimously declare: First, that every individual who is willing to work has a right to demand from organized society the opportunity to labor and to receive for that toil its full value; second, that it is the duty of the whole people in their collective capacity to so administer the affairs of the commonwealth as to secure to all their just demand. [Proposed by P. Ross Martin of Sacramento, Cal.]

WHEREAS, The continued invention of machinery, the monopolization of the natural resources, competition, profit, production and the concentration of capital are fast reducing the working classes to absolute slavery;

Resolved, That it is imperative that every branch of wage workers be organized and that when so organized the work of agitation, organization, federation and education be unceasingly pursued. [Proposed by J. H. Thorner and Alfred Reed of the Seaman's Union.]

Plan of Action.

Resolved, That an organizing committee of eleven be appointed to federate all the labor organizations of the coast upon the following basis: The name to be the Central Labor Union of the Pacific Coast; each union to send one delegate for each 250 members or fraction thereof; each class of unions in particular occupations to be federated under the name of Trades' Assemblies at the earliest possible moment. [Proposed by Martin Schneider of the Dyers' Union.]

The Organizing Committee.

The committee elected to organize the movement were these: E. A. Wallazz, of S. F.; P. Ross Martin, of Sacramento; E. Kelsey, of the Grangers; W. C. Owen, of S. F.; C. Danielswietz, of S. F.; A. B. Tully, of San Bernardino; J. A. Anderson, of S. F.; E. G. Anderson, of S. F.; Edward Cagney, of Eureka; B. G. Haskill, of S. F.; Theodore Hallhick, of S. F.; James J. Martin, of S. F.; Frank Roney, of S. F.; C. F. Keller, of Tulare county; J. H. Redstone, of S. F.

Resolved, That this convention, while not condemning strikes for shorter hours or higher pay as temporary measures of relief, regards the nationalization of land, of the means of transportation, of the circulating medium and of the implements of production as the only satisfactory solution of the labor question.

Resolved, That this convention, having regard to the strained relations at present existing between employer and employed, looks with the gravest apprehension upon the virtual establishment of a standing army in this country by the continued enrollment of the new militia corps, and the employment by the capitalists of armed detectives, and that this convention commends this matter to the serious attention of the labor organizations of the coast.

Resolved, That it shall be the duty of all accredited delegates to this convention to invite their respective organizations to attend a mass meeting in a hall, to be fixed by the committee, on Saturday, March 28th, for the purpose of receiving the report of this convention, and that a committee of nine be appointed to prepare and speak to such report.

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Andes S M Co	Nevada	26	25	Mar 2	Apr 8	Apr 30	B Burris	309 Montgomery st
Alpha Con M Co	Nevada	19	50	Jan 20	Feb 26	Mar 21	W Willis	309 Montgomery st
Belmont M Co	Nevada	39	15	Feb 11	Mar 21	Apr 13	J W Pew	310 Pine st
Bulwer Con M Co	California	1	20	Jan 13	Feb 24	Mar 31	W Willis	309 Montgomery st
Butte Creek H M Co	California	11	10	Jan 30	Mar 9	Mar 31	R L Taylor	230 Montgomery st
Bueva Santa M Co	Mexico	5	25	Jan 22	Feb 27	Mar 29	W L Oliver	328 Montgomery st
Champion G M Co	California	18	10	Jan 28	Mar 6	Mar 26	T Wetzel	522 Montgomery st
Caledonia M Co	Dakota	15	15	Jan 27	Mar 9	Apr 6	W L Oliver	328 Montgomery st
Con Virginia and California	Nevada	2	20	Jan 15	Feb 20	Mar 21	A W Havens	309 Montgomery st
Con Amador M Co	California	9	50	Mar 16	Apr 15	May 1	F B Latham	408 California st
Excelsior W and M Co	California	7	50	Sept 2	Apr 8	Apr 25	W J Stewart	215 Sansome st
Eintracht Gravel M Co	California	17	05	Dec 9	Mar 3	Mar 21	H Kuntz	309 Sansome st
Exchequer M Co	Nevada	21	20	Jan 2	Mar 3	Mar 23	C C Elliott	309 Montgomery st
Golconda M Co	California	1	03	Feb 7	Mar 12	Mar 31	J M Buttington	309 California st
Golden Channel M Co	California	2	01	Feb 12	Mar 26	Apr 21	A B Paul	328 Montgomery st
Hale & Norcross M Co	Nevada	84	50	Mar 2	Apr 7	Apr 28	E B Holmes	309 Montgomery st
Hazard G M Co	California	6	05	Jan 21	Feb 23	Mar 28	J T McGoghegan	318 Pine st
Homeward Bound Pl M Co	California	3	15	Feb 21	Mar 12	Apr 5	D A Smith	209 Post st
Indian Spring Drift M Co	California	5	03	Feb 19	Mar 23	Apr 23	A B Paul	328 Montgomery st
Independence M Co	Nevada	14	13	Jan 21	Mar 2	Mar 30	J W Pew	310 Pine st
Ma tin White M Co	Nevada	19	25	Jan 15	Feb 25	Mar 25	J J Scoville	309 Montgomery st
Mexican M Co	Nevada	29	25	Feb 24	Mar 31	Apr 21	C E Elliott	309 Montg mery st
North Star G M Co	California	1,150	Mar 5	Apr 9	May 1	J A Jennings	401 California st
North Banner Tunnel Co	California	6	5c.	Feb 7	Mar 13	Apr 7	T J Mitchell	Grass Valley
Ophir M Co	Nevada	49	50	Feb 18	Mar 24	Apr 13	E B Holmes	309 Montgomery st
Potosi M Co	Nevada	17	25	Jan 27	Mar 2	Mar 24	C L McCoy	309 Montgomery st
Rocky Bar M Co	California	8	25	Feb 18	Mar 24	Apr 13	G W Hill	Grass Valley
Sulphur Bank Q M Co	California	3	50	Feb 25	Apr 16	Jun 1	L Hermann	220 Sansome st
Savage M Co	Nevada	12	50	Feb 2	Mar 6	Mar 26	E B Holmes	309 Montgomery st
Sierra Nevada M Co	Nevada	81	25	Feb 18	Mar 25	Apr 14	E S Parker	309 Montgomery st
Summers Con M Co	California	3	05	Mar 17	Apr 20	May 12	F E Luty	330 Pine st
Tower Con M Co	California	2	10	Mar 11	Apr 15	May 5	G W Sessions	309 Montgomery st
Union Con M Co	Nevada	23	25	Feb 16	Mar 24	Apr 14	J M Buttington	309 California st
Yosemite M Co	California	2	2½	Feb 7	Mar 16	Apr 21	J Wsisheim	Grass Valley

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Bulwer Con M Co	California	W Willis	309 Montgomery st	Annual	Apr 8
Champ'on M Co	California	T Wetzel	522 Montgomery st	Annual	Apr 10
St George M Co	Nevada	A W Rose Jr	309 Montgomery st	Annual	Apr 6

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bonanza King M Co	California	D C Bates	309 Montgomery st	25	Sept 15
Bodie Con M Co	California	B L Barling	328 Montgomery st	50	Dec 5
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Dec 15
Derbee Blue Gravel M Co	California	T Wetzel	522 Montgomery st	10	Oct 8
Jackson M Co	California	D C Bates	309 Montgomery st	10	Dec 27
Kossnth M Co	Nevada	C K Sturtevant	328 Montgomery st	06	Mar 16
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Feb 13
Paradise Valley M Co	Nevada	W Letts Oliver	328 Montgomery st	10	Nov 28
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Feb 16
Syndicate M Co	California	J Stadfeldt	419 California st	10	Nov 6

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE.	Portland. Rain.	Temp.	Wind.	Weather.	Red Bluff. Rain.	Temp.	Wind.	Weather.	Sacramento. Rain.	Temp.	Wind.	Weather.	S. Francisco. Rain.	Temp.	Wind.	Weather.	Los Angeles. Rain.	Temp.	Wind.	Weather.	San Diego. Rain.	Temp.	Wind.	Weather.
Mar 19-Mar 23																								
Thursday	.00	57	NW	Cl.	.00	68	S	Fr.	.01	64	S W	Fr.	.00	56	W	Cy.	.C0	67	S	Cl.	.02	61	W	Cl.
Friday	.00	55	—	Cy.	.00	64	W	Cl.	.00	60	W	Cy.	.—	55	S W	Cy.	.—	65	SE	Cy.	.—	60	W	Cy.
Saturday	.00	54	W	Cy.	.00	62	E	Cl.	.00	61	S W	Cl.	.00	57	SE	Cy.	.00	65	N W	Cy.	.08	64	W	Cy.
Sunday	.00	57	N W	Cl.	.00	70	S	Cl.	.00	63	N	Fr.	.00	57	SE	Cy.	.00	63	S W	Cy.	.00	64	W	Cy.
Monday	.00	56	N W	Cl.	.00	73	N	Cl.	.00	57	N	Fr.	.06	53	S W	Cy.	.00	66	W	Cy.	.00	61	W	Cy.
Tuesday	.00	64	N W	Cl.	.06	66	W	Cl.	.00	64	S	Cl.	.00	58	N W	Cy.	.—	63	S	Cy.	.00	66	S W	Cl.
Wednesday	.00	62	N	Cl.	.00	68	S	Cy.	.00	64	S	Cy.	.06	61	N E	Cy.	.01	67	W	Cy.	.22	66	S W	Cl.
Totals	.00				.00				.01				.06				.01				32			

EXPLANATION.—Cl. for clear; Cy., clondy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature wind and weather at 12:00 M. (Pacific Standard time), with amount of rainfall in the preceding 24 hours.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Mar. 5.		WEEK ENDING Mar. 12.		WEEK ENDING Mar. 19.		WEEK ENDING Mar. 26.	
Alpha	.60	.75	....	.70	....	.60	.60	.65
Alta	.25	.30	....	.30	.25	.30	.15	.25
Andes	.11	.25	.10	.15	....	.10	....	.05
Argenta	....	....	....	....	....	....	....	....
Belcher	....	.70	....	.70	....	.75	.75	.80
Belding	....	....	....	....	....	....	....	....
Best & Belcher	.50	1.25	1.05	1.20	1.05	1.10	.90	1.05
Bullion	....	.25	....	....	....	.20	....	.25
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	.50	....	.20	....	2.35	....	....
Bodie Con	2.15	2.65	2.25	2.45	2.10	2.30	2.10	2.30
Beuton	.05	.10	.05	.10	....	....	....	.05
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.25	.35	....	.35	....	.30	.35	.40
California	.25	.60	.40	.90	.30	.45	.35	.40
Challenge	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Chollar	2.05	2.80	1.90	2.35	1.85	1.95	1.65	2.00
Confidence	....	.75	....	.80	....	.70	.75	.80
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.25	.60	.40	.90	.30	.45	.35	.40
Con. Pacific	....	.95	....	1.00	....	1.00	....	....
Crown Point	.80	1.05	.70	.80	.70	.80	....	....
Day	....	....	....	....	....	....	....	....
Eureka Con	....	....	....	....	4 10	5.00	....	....
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	.20	.25	....	.25	....	....	....	.25
Grand Prize	....	.35	.30	.40	....	....	....	....
Gould & Curry	.50	1.00	.80	.95	.75	.85	.70	.80
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	3.85	5.38	4.95	6.00	5.12	5.75	4.85	6.00
Holmes	....	4.60	4.60	5.00	....	5.00	....	....
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	....	....	....	....	....	.16	....	....
Martin White	.50	1.35	....	....	....	.50	....	.65
Mono	1.35	1.55	1.35	1.45	1.25	1.35	1.20	1.30
Mexican	.20	.40	.35	.40	.20	.35	.15	.25
Mt. Diablo	....	....	....	3.70	3.75	3.90	....	3.35
Northern Belle	....	....	....	....	....	....	....	....
Navajo	1.05	1.20	1.00	1.10	1.05	1.10	1.10	1.15
North Belle Isle	....	....	....	.20	....	.20	....	.15
Occidental	....	1.00	.90	1.00	....	.95	....	.85
Ophir	.20	.80	.20	.25	.10	.20	.55	.60
Overman	.20	.80	....	.15	....	.20	....	....
Potosi	.75	1.05	.85	1.60	.80	.90	.75	.90
Pinal Con	....	....	....	....	....	....	....	....
Savage	.95	1.50	1.20	2.05	1.85	1.95	1.85	2.20
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	.20	.40	.35	.40	.25	.40	.25	.50
Silver Hill	....	....	....	....	....	....	....	....
Silver King	....	....	....	4.50	....	....	3.25	3.75
Scorpion	....	.10	....	.10	....	.10	....	.10
Syndicate	.45	.50	.45	.50	....	....	.40	.45
Tioga	....	....	....	....	....	....	....	....
Union Con	.25	.40	.30	.3	.15	.30	.40	.45
Utah	.40	1.00	....	....	....	.60	....	....
Yellow Jacket	1.20	1.30	....	1.30	1.25	1.30	1.25	1.35
	....	....	....	....	....	....	....	....

THE Bald Mountain mine, at Forest City, Sierra county, cleaned up 210 ounces of gold last week. The Bald Mountain Extension cleaned up a little over 110 ounces.

A considerable quantity of Japanese cake copper has been arriving in London lately, and sells at £47 per ton.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Mar. 26, 1885.

ANTIMONY—Per pound	@	—
Hallet's	12½@	—
Cookson's	13 @	—
BORAX—Refined	7 @	8
IRON—Glengarnock ton	25 50 @	—
Eglinton, ton	23 50 @	—
American Soft, ton	27 00 @	—
Oregon Pig, ton	@	—
Clipper Gap, Nos. 1 to 4	25 00 @	30 00
Clark Lane White	26 00 @	—
Shotts, No. 1	26 00 @	—
STEEL—English, lb	16 @	25
Black Diamond, ordinary sizes	13 @	—
Plow	6 @	8
Machinery	10 @	12
Sanderson Bros	13 @	—
COPPER—		
Brazers' sizes	— @	25
Fire-box sheets	23 @	—
Bolt	22 @	—
Yellow Metal	14 @	15
Ingot	14 @	15
LEAD—Pig	3½@	3¾
Bar	5 @	—
Pipe	7 @	—
Sheet	8 @	—
Shot, discount 10% on 500 bag Drop, ₱ bag	1 85 @	—
Buck, ₱ bag	2 05 @	—
Chilled, do	2 25 @	—
TINPLATE—Oldcastle	5 25 @	6 00
Charcoal	5 75 @	6 75
Coke	5 25 @	6 50
Roofing	6 25 @13	50
ZINC—German	9 @	10
Sheet, 7x3 ft, 7 to 10 ₱, less the cask	9 @	10
QUICKSILVER—By the flask	33 50	
Flasks, new	1 05 @	—
Flasks, old	85 @	—
NEW YORK PRICES—		
California Borax, refined	8 @	8¼
Pig Iron, American No. 1	17 50 @18	50
Quicksilver	46 @	—
Lead	3 70 @	—
Copper	10½@	11
Tin	17½@	—
Bar Silver	1 06@	—

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Mar. 26. 2750 Con Va & Cal.....40c
100 Bodie Con.....2.25 100 Confidence.....75c
300 B. & Belcher.....1.00 50 Crown Point.....75c
85 Bulwer.....35c 350 Gould & Curry.....80c
150 Chollar.....2.00 1570 Hale & Nor.....80
100 Gould & Curry.....80c 150 Mexican.....15c
1100 Hale & Nor....5.50@5.62 400 Mono.....1.20
30 M. White.....55c 50 Martin White.....65c
200 Mexican.....20c 300 Navajo.....1.10
50 Potosi.....80c 250 Ophir.....56@60c
150 Sierra Nevada.....50c 50 Occidental.....85c
$10 Savage.....2.10 50 Potosi.....85c
100 Scorpion.....10c 200 Sierra Nevada.....45c
AFTERNOON SESSION. 2250 Savage.....2.00@2.05
55 Bodie.....2.20 200 Silver King.....3.25
550 Bulwer.....35c 50 Scorpion.....10c
200 Chollar.....1.95@2.00

SHIPPING business amounting to nearly four millions yearly has been established in Philadelphia, since June, by American agents of European capitalists engaged in refining petroleum in France, Spain and Austria, and since October last the agency has shipped nearly 500,000 barrels of crude oil.

Market Reports.

Lumber at Wholesale.

There is a fair trade in lumber, but no special changes in price. Quotations of cargo rates are as follows for redwood lumber, for delivery at San Francisco, Oakland, Alameda, Berkeley, Vallejo, Benicia, Port Costa, Martinez and Antioch:

ROUGH—No. 1 rough merchantable, $18; No. 2 (refuse) rough, $14; No. 1 rough boards (specified width, 10 inches and over), $19; No. 2 (refuse) do do do, $14; No. 1 rough lumber, surface one side, $21; No. 2 (refuse) do do do $18.

PICKETS—Rough square pickets, $12; rough pointed do, $14; fancy pointed do, $22.

HALF-INCH LUMBER—No. 1 ½-inch surfaced, board measure, $40; No. 2 do do do, $39; No. 3 do do do, $38; No. 4 (refuse) do do do, $32; No. 1 ½-inch battens, board measure, $40; No. 2 (refuse) do do do, $32; No. 1 ½-inch siding, 12 ft. and over, b m, $40; No. 2 (refuse) do do do $32; ½-inch siding, under 12 ft, $32.

RUSTIC—No. 1 Rustic, 1x10, 12 ft and over, $33; No. 2 do do do, $32; No. 3 do do do, $31; No. 4 Rustic, 1x10, $28; No. 6 (refuse) do do do, $21; No. 1 Rustic, 1x8, 12 ft and over, $31; No. 2 do do do, $30; No. 3 do do do, $29; No. 4 Rustic, 1x8, $26; No. 5 refuse) do do, $21.

CLEAR—No. 1 surfaced and rough clear, $32; No. 2 do do do, $31; No. 3 do do do, $30; No. 4 (refuse) do do do, $24; No. 1 surfaced and rough clear, 1x8 and 1x6, $30; No. 2, do do do, $29; No. 3 do do do, $28; No. 4 (refuse) do do do, $24.

[Dimensioned, Surfaced and Rough Clear (widths and lengths), 12 inches wide and over, add $1 ₱ M (on each corresponding grade) to the above list price of "Clear."]

TONGUED AND GROOVED—No. 1 T and G, 1x4, 12 feet and over, $32; No. 2 (refuse) do do do, $24; No. 1 T and G, 1x6, 12 ft and over, $30; No. 2 (refuse) do do do, $24; T and G, 1x6, 7 to 11 ft, $26; do do, under 7 ft, $23.

TONGUED, GROOVED AND BEADED—No. 1 T, G and Beaded, 1x4, 1¼x4 and 1¼x6, 12 ft and over, $32; No. 2 (refuse) do do do, $24; T, G and Beaded, 1x4, 1¼x4 and ¼x6, 7 to 11 ft, $27; do do, under 7 ft, $22.

ROUGH CLEAR—1x6 and under in width, and under 12 ft in length, $24.

[On a credit of 60 days, or a discount at the rate of 1 per cent per month for anticipated payments, and not less than 1 per cent per month added for extension of the same].

We quote cargo rates—Pine—Merchantable Rough, $15 ₱ M; Flooring, $24.20; Stepping, $37 ₱ M; Redwood—Merchantable Rough, $18; Surfaced, $32; Rough Clear, $32; Rustic, $33; Tongued and Grooved, $30; Tongued, Grooved and Beaded, $32.

Lumber at Retail.

Retail quotations for fir and spruce are as follows:

ROUGH MERCHANTABLE.—(Ordinary sizes) to 40 feet long, per M ft, $22.50; Rough Merchantable, 1x6, Fencing, $22.50; do do, 1x4, do, $23.50; do do, 1x3, do, $24.60; do do, 1x4, odd lengths, $22.50; do do, 1x6, do $24.50; do No. 2, all sizes, $18.50; do Selected, $26.50; do Clear, other than for T and G and Stepping, $31.

[Rough Clear for T and G and Stepping $1 ₱ M less than price of kind for which intended.]

Dressed T and G Flooring, 1x0, No. 1, vertical grain, ₱ M ft, $38.60; Dressed T and G Flooring, 1x6, No. 1, $33.50; do do do, No. 2, $28.60; Dressed T and G Flooring, 1x3, 1x4, 1¼x4 and over, No. 1, vertical grain, $40.50; do do do, No. 1, $35.50; do do do, No. 2, $20.50; Dressed Stepping, No. 1, vertical grain, $42.50; do do, No. 1, $37.50; do do, No. 2, $28.50.

SPRUCE—Rough Merchantable, ₱ M ft, $21.60; do Clear, $35; Clear Dressed (shelving), $40; Pickets (rough) board measure, $20.50; Furring, 1x2, per lineal ft, 1c; Laths, 1 and 1½ inch, ₱ M, $3.50; 1½-inch, $4.

[N. B.—For all sizes over 14 inches, and lengths over 40 feet, extra rates].

PINE—Rough, $14.00: No. 2, $11.00; do do in lengths, $12.00; rough, 40 to 50 ft lengths, $15.00; do 50 to 60 ft, $16.00; T and G Flooring, 1x6, $25 00; do do 1¼x6, $27.00; do do 1x4, $27.00; do do No. 2, $20.00; Vertical Grain T and G Flooring, 1x6, $28.00; do do do 1¼x6, 1x4, $30.00; Stepping, $35.00; Furring, 1x2, per lineal ft, ¾c.

REDWOOD—Rough, $16 00; No. 2, $12.00; Surfaced, $30.00; do, 1x8, $28.00; do, 1x0, $28.00; T and G, 6 in. 12 ft and over, $28.00; do do, 7 to 11 ft, $25.00; do do, under 7 ft, $20.00; Rustic, $30.00; do No. 2, $25.00; T and G Beaded, 12 ft and over, $30.00; do do, 7 to 11 ft, $25.00; do do, under 7 ft, $20.00; Siding, ½ in, $22 50; Picket, fancy, $25.00; do do, rough pointed, $15.00; do do, square, $14.00; Battens, ½x3 in, per lineal ft, ¾ c; Shingles, $2.00; Lathe, 1½, $3 25; do 1½, $3.75; Dunnage Boards, less 5 per cent, delivered, $16.00.

Nails.

We give the price list of the Pacific Iron and Nail Company.

FENCE AND BRAD.—10d to 60d, $2.90: 8d and 9d, $3.00 6d and 7d, $3.25 4d and 5d, $3.50; 3d, $4.25; 2d, $5.50

BARRELS.—¾ inch, $6.75; ⅝ inch, $5.75; 1 inch, $5.25; 1¼ inch, $4.50; 1½ inch, $4.25; 1¾ inch, $3.75; 1½ inch, $3.50.

LINING.—¾ inch, $7.25; ⅝ inch, $8.75.

TOBACCO.—10d, $3.25 8d, $3.50; 6d to 7d, $3.76.

CLINCH.—6d to 30d, $4.50.

SLATING.—5d, $3.75; 4d, $3.75; 3d, $4.50; 2d, $5.76.

FINISHING.—2d, 1 inch, $8.75; 3d, 1¼ inch, $6.76; 4d, 1½ to 1¾ inch, $4.50; 6d, 2 inch, $4.25; 8d, 2½ inch, $4.00; 10d, 1 inch and over, $3.75.

CASING AND BOX.—10d to 30d, $3.50; 8d, $3.75; 6d, $8.00; 4d, $4.25; 3d, $5.25.

FINE BLUED.—4d, $4.50; 3d, $5.75; 2d, $6 50

CUT SPIKES.—All sizes, $3.00

BOAT SPIKES.—All sizes, $3.50.

Each half keg 10 cents extra.

TERMS.—Note or acceptance at 00 days with current rate of Exchange on S. F., or a discount of 2 per cent for cash, if remitted within 10 days from date of invoice.

All accounts when due subject to sight draft without notice.

An abatement of 10 cents per keg will be allowed upon orders of 200 kegs or over.

Building Material.

Lime, per barrel, $1.50@$1.00. Plaster, $2.75–3.00. Eastern Plaster, $3.00–3.26. Rosendale Cement, $2.25–2.75. Portland Cement, $3.50–3.75. Fire Brick, per 1,000, $40 @ $45, according to brand; hard, $10.00@$12,00; red, $8.00@$8.50; soft, $7.50; face, $30.00.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
J. J. BARTELL—Sacramento and San Joaquin Counties.
A. C. KNOX—San Benito and Monterey Counties.
GEO. MCDOWELL—Santa Clara and Santa CRUZ Co's.
G. W. INGALLS—Arizona.
M. S. PRIME—Alameda County.
MRS. OZIER—Napa County.
W. H. H. HUSSEY—Contra Costa County.
C. M. CARR—Oakland.
W. B. TURNER, Santa Barbara and San Luis Obispo Cos.
J. M. LOGAN, San Francisco.
F. W. SMITH, Arizona.
ED. SMITH, San Jose.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY TO THE LABEL ON YOUR PAPER.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING MARCH 17, 1885.

313,975.—FRUIT CANNING APPARATUS—W. H. Austin, Vacaville, Cal.

313,911. GRAIN CLEANER—Daniel Best, Albany, Or.

314,099.—FRUIT JAR—J. G. Briggs, San Jose, Cal.

313,928. AUTOMATIC RAILWAY SWITCH—C. L. Drake, S. F.

314,117.—PUMP—C. H. Foster, Alameda, Cal.

314,015.—DERRICK—O. E. Halin, S. F.

314,180.—TESTING SEALED CANS—M. L. Hutchings, Astoria, Or.

314,026.—ILLUMINATING BASEMENTS—P. H. Jackson, S. F.

314,135.—ROAD SCRAPER AND EXCAVATOR—C. M. Jones, Fresno, Cal.

313,872.—CLINOMETER—J. Kindleberger, Los Angeles, Cal.

314,036.—DYNAMITE SHELL—M. F. Jones, Fort Apache, A. T.

314,086.—BUNG CUTTER—Henry Waas, S. F.

314,093.—STOVE—Sarah A. H. Williamson, Carson, Nev.

nent officers will be elected to-day, and in our next issue further information will be given to the public.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CABLE RAILWAYS.—Joel B. Low and A. K. Grim, S. F. No. 313,602. Dated March 10, 1885. This improvement consists in novel frame-work sections by which the tube, track and slot-irons are supported, the sections being in turn united and bound together by the track, slot-irons and tube in such a manner as to prevent the slot from opening or closing.

BITTING AND DRIVING HARNESS.—Richard C. Irvine, Sacramento, No. 313,673. Dated March 10, 1885. This is a bitting harness which may readily be converted into a driving harness and *vice versa*. It consists in the adaptation of the hip-strap of the driving harness to serve as the side back-straps of the bitting harness; in a fastening on each side of the saddle adapted to engage the ends of the side back-straps and the side check straps of the bitting harness and the shaft bearers and tugs of the driving harness, and in suitable fastenings upon said straps by which their various engagements are readily effected. In teaching a colt to become accustomed to the bit or "bridle-wise," as it is termed, a harness known as a "hittiug" harness is employed. This differs from the ordinary driving harness in the omission of some parts, and changed construction and adaptation of others to make the harness serve the special purpose. The bitting harness is usually a separate and distinct one from that used for driving, and they cannot be used interchangeably. It is the object of this invention to provide by means of a proper construction, arrangement and adaptation of parts, a harness which can be readily converted from one to the other kind and answer effectively for either.

GOVERNOR.—Byron Jackson, S. F. No. 313,595. Dated March 10, 1885. This governor for steam engines is especially applicable in that class in which the valve-operating eccentric is moved relative to its shaft by centrifugally acting weights, so as to vary the throw of the valve, and thus control the admission of steam to the cylinder. It consists of two eccentrics, one of which is movable about the first, a means for actuating the two eccentrics, so that the action of the weighted, centrifugally-operating arms is relieved from the strain caused by the friction of an unbalanced slide-valve. It also consists in a means for adjusting and regulating centripetally-operating springs, so that they may be regulated for different rates. In the construction of engines—governors of that class in which either a single eccentric is turned upon the shaft, or in which a second eccentric is turned upon the first, in order to insure uniform lead-openings of the valve, while the closing or cut-off point is varied, the whole strain of moving the valve under the friction caused by the steam pressure devolves upon the eccentric, and from this it acts upon the weights, by the centrifugal action of which the eccentrics are adjusted, so that with a varying steam pressure the action of these weights will vary considerably and the cut-off be made irregular. In Mr. Jackson's invention he has connected the eccentrics and driver by a crank arm or link, so that one eccentric may be moved about the shaft within the other, which drives the valve and the weighted arms, by the centrifugal action, by which the eccentric is moved to vary the throw of the valve, and relieved from the strain of moving the valve.

DOUBLE-ACTING SUBMERGED PUMP.—Chas. H. Foster, Alameda. No. 314,417. Dated March 17th, 1885. This double-acting submerged pump is for deep wells, and more especially for artesian or bored wells, in which the diametrical space is limited. The invention consists in a novel double-valved plunger and hollow piston as applied to a cylinder having valves at each end. The object is to provide a double-acting pump having small area in cross-section, whereby it is adapted for artesian or bored wells, or for any wells in which the space is limited, and by reason of its double action has an increased capacity in a given time.

DERRICK.—Ole E. Halin, S. F. No. 314,015. Dated March 17, 1885. The improved derrick consists in a platform supported by peculiarly-hinged folding legs, horizontal, spaced, and intermeshing gears, bearing sprocket or chain pulleys between them, a chain tackle passing around and between the chain pulleys and over guide pulleys in the platform, a retaining pawl for the chain, a hinged lever and ratchet wheel mechanism between it and the driving shaft of the operating gears, and in a mechanism for throwing the lever out of engagement.

ELEVATOR AND FIRE ESCAPE.—Zachariss Ludwig, East Oakland, No. 312,784. Dated, Feb. 24, 1885. This is an apparatus which is especially used as a fire-escape, although it may be used for other purposes, where it is necessary for persons to raise or lower themselves within a building without the use of an engine or any other exterior mechanism. It consists of a cage or platform suspended by a cable from a drum or roller at the top of the building, having guides between which it travels, suitable safety catches, and weights suspended from ropes passing around pulleys which are fixed upon the shaft or drum, around which the cable passes; a brake and a means for applying the same so as to regulate the rate of ascent; secondary ropes passing around pulleys upon the upper cable drum, and other pulleys situated beneath the lower floor; a point of rest, and levers or arms within the cage which may be applied to produce friction against the ropes passing around these pulleys to regulate the descent of the cage. It also consists in the application of supplemental weights having ropes passing over pulleys and leading down into the inside of the well in which the cage moves, with hooks or attachments near the bottom, where they remain attached when out of use. When it is desired to elevate the cage to the top of the shaft or well, two or more of these ropes may be detached from their fastenings and attached to the sides of the cage, so that with the additional weights upon the opposite ends of the ropes will assist in raising the cage to the top. Between the walls of the elevator shaft and the surrounding portions of the building may be formed an air space which will carry away any smoke which may enter it, and may also prevent undue heating of the elevator shaft, by reason of the fire surrounding it, so that it will be possible for persons to descend it in a case of emergency.

Mining Share Market.

There has been very little of interest in the stock market for the week past. The people here are like those in Virginia City, close by the mines. Of these the *Enterprise* says: The fact of the matter is that the people here expect everything to be done in a moment, and cannot wait for developments. If a bonanza is not produced in a week the small buyers get frightened and sell out. The consequence is that the price of any particular stock is liable to go down. The people here are extremists; there is no half-way about them, and they are either very enthusiastic or very blue. If any one would for a moment consider the situation they must come to the conclusion that it takes time to run drifts, build stations, make cross cuts and do other work in a mine necessary to ascertain the condition and prospect of the same. The price of Norcross has dropped a little from the fact that cross-cutting has not been commenced on the 2900 and 3000 levels, and a bonanza has not been shown up. The managers of the Norcross do not propose to cross-cut until the drifts have been advanced to a distance satisfactory to themselves, and as they fully understand the situation, it is folly for outsiders to imagine that the Norcross is a failure. The officers of the mine say that the prospect of finding a large body of ore is better at present than ever.

Bullion Shipments.

Christy, March 17, $1,500; Honerme, 18, $4,800; Ontario, 19, $19,605; Stormont, 20, $2,850, Crescent, 20, $2,600; Wood River ore, 20, $1,150; Hananer, 20, $18,200; Wood River ore, 22, $1,800; Christy, 22, $1,555; Ontario, 22, $19,605. The Utah base bullion and ore output for the week was 54 cars of bullion and eight cars ore. The weight of the bullion was 1,328,400 pounds, and the ore 242,700 pounds.

A GAS METER inspector, examined by the Gas Committee of the New York Legislature, on Monday, said that some meters run fast and some run slow. In Philadelphia he found meters were from 3 to 16 per cent fast.

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THE BEST PRACTICAL MINING JOURNAL IN THE WORLD.

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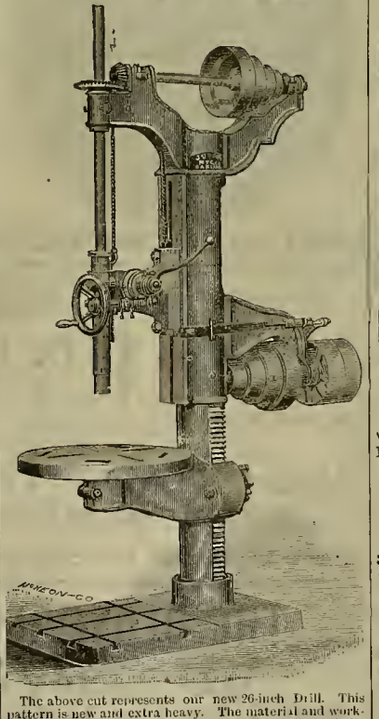
A Plain Book on Assaying.

"ASSAYING GOLD AND SILVER ORES"—By C. H. Aaron—Is a new work published by Dewey & Co., which is intended by its author to be available for the use of miners, prospectors and others who only care to know how to assay gold and silver ores. The author of this work is well known in the mining regions of the Pacific coast as a practical metallurgist of many years experience. His writings for the press and his two previous works ("Testing and Working Silver Ores," and "Leaching Gold and Silver Ores") have shown his ability as a writer. The little book is plainly and simply written, more especially for the use of those persons not familiar with chemistry. No symbols are used, everything being plainly stated and clearly described. The scope of the book is shown in its table of contents as follows: Introduction; Implements; Assay Balance; Materials; The Assay Office; Preparation of the Ore; Weighing the Charge; Mixing and Charging; Assay Litharge; Systems of the Crucible Assay; Preliminary Assay; Dressing the Crucible Assays; Examples of Dressing; The Melting in Crucibles; Scorification; Cupellation; Weighing the Bead; Parting; Calculating the Assay; Assay of Ore Containing Coarse Metal; Assay of Roasted Ore for Solubility; To Assay a Cupel; Assay by Amalgamation; To Find the Value of a Specimen; Tests for Ores; A Few Special Minerals; Solubility of Metals; Substitutes and Expedients; Assay Tables. These assaying tables give simple directions for figuring out results. This is the simplest, cheapest and most easily comprehended work on assaying yet published. The volume comprises 106 pages, with illustrations, and is well bound in cloth. The price is $1, postpaid. Published by Dewey & Co., MINING AND SCIENTIFIC PRESS office, San Francisco—1884.

DRILL PRESS.



The above cut represents our new 26-inch Drill. This pattern is new and extra heavy. The material and workmanship is first-class in every particular. The spindle and head is counterbalanced with chain and weight, with a vertical adjustment of 20 inches. The spindle is made of hammered steel, bored out to fit the No. 3 Morse Drill Socket, and has 8 inches of travel. The quick return attachment is very strong, simple and perfect in its action. The face-plate swings round the column in any position, can be raised or lowered 18 inches, and will receive work 32 inches high and 26 inches diameter. The bed-plate is planed, and will receive work 46 inches high. The pinion and rack for lowering the table is placed on the side and revolves with the table. In this position, the dirt and borings falling from the table cannot get in the rack. The pulleys on lower cone shaft are 10 inches diameter for 3-inch belt, and should run 250 revolutions per minute. There are four belt speeds on cones, which are turned suitable for 2½-inch belt. Weight, 1,500 pounds.

Price, $275, less 10 per cent.

We also manufacture a Pulley Drilling Machine for drilling the set screw holes in Pulley Hubs without drilling through the outside rim. It can be attached to our drill in one minute, simply by removing the face-plate and setting pulley drilling attachment in the face-plate socket. This machine can be attached to any ordinary drilling machine. Weight 100 pounds. **Price, $50.**

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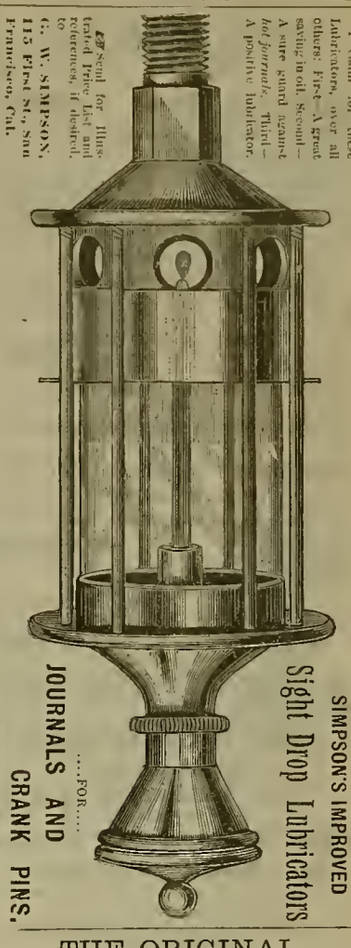
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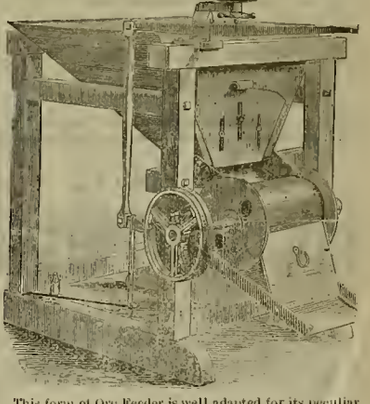
(PATENTED JUNE 24, 1873.)



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Manufacturers of the Celebrated "Challenge" Ore Feeders for wet and sticky ores; also "Stanford Improved" Ore Feeders and Tullock's Ore Feeders for dry ores.

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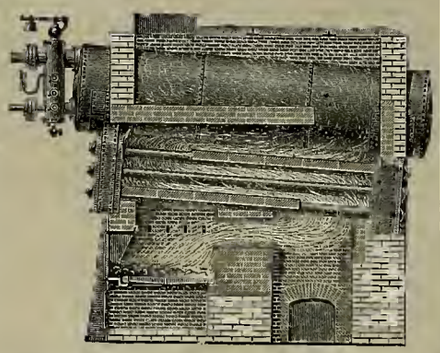

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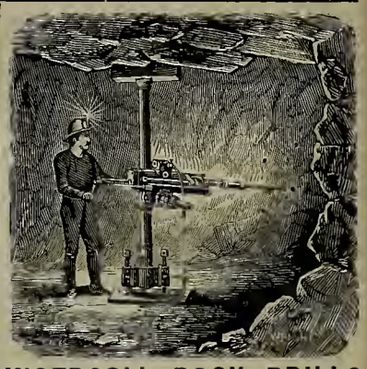

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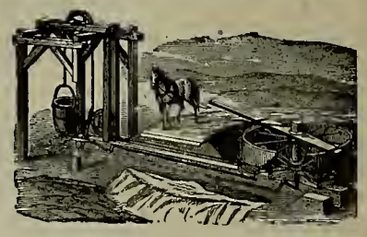

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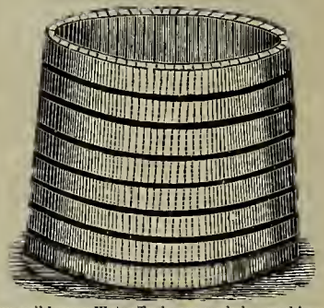

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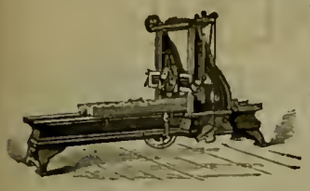
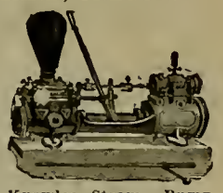


Putnam Planer.



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C Hendel Jan 24 '85

NOTICE TO MINING MEN!

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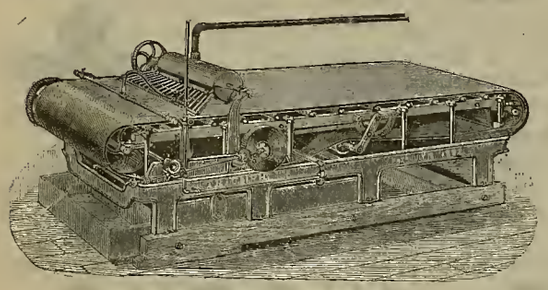
$1,000 CHALLENGE ACCEPTED!



THE "TRIUMPH" ORE CONCENTRATOR.

PRICE, FIVE HUNDRED AND FIFTY DOLLARS ($550.00), F. O. B.

THE "TRIUMPH" TRIUMPHANT!

In a competitive trial recently had between two of the **"Triumph" Ore Concentrators** and the same number of **"Frue" Vanning Machines**, at the mill of the celebrated gold producing Original Empire Mill and Mining Company, in Grass Valley, Nevada County, Cal., the "Triumphs" produced thirteen and fifteen one-hundredths (13.15) per cent more concentrations than did the "Frue" Vanners, during a run of twenty-four consecutive days, or a net gold coin result of $199.15, or $8.30 per day, in favor of the two "Triumph" Concentrators.

These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarly saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with accurate deductions therefrom, will soon be published in Circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and **we hereby accept the Challenge of $1,000**, flaunted by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

We guarantee purchasers against all costs, expenses or charges incurred by reason of any infringements of any existing patents.

"Put up or shut up," and "Let the Best Machine win!"

JOSHUA HENDY MACHINE WORKS,

Nos. 39 to 51 Fremont St., San Francisco, Cal

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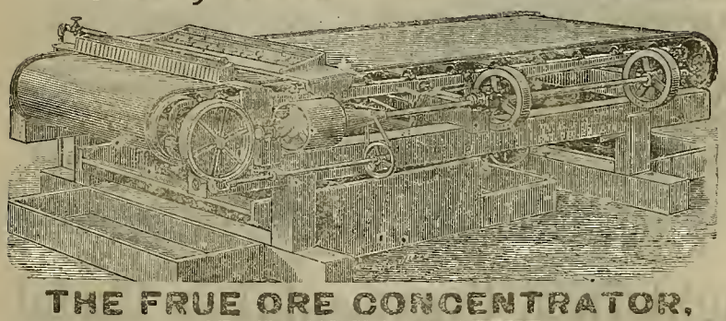

THE FRUE ORE CONCENTRATOR, OR VANNING MACHINE.

PRICE: FIVE HUNDRED AND SEVENTY-FIVE DOLLARS, ($575 00), F. O. B.

OVER 1,000 ARE NOW IN USE. Saves from 40 to 100 per cent more than any other Concentrator. Concentrations are clean from the first working. The wear and tear are merely nominal. A machine can be seen in working order and ready to make tests at the Fulton Iron Works, No. 220 Fremont Street, San Francisco.

As the result of a suit East against an End-Shake Machine (the Embrey), similar to the Triumph, the Frue Vanning Machine Company owns the Embrey patent, and can put in the market an End-Shake Machine of earlier patent that will do as good work as the Triumph, and superior in construction and durability. There will be no risk of suit for infringement.

The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement on patents owned by them.

Protected by patents May 4, 1869, Dec. 22, 1874, Sept. 2, 1879, April 27, 1880, March 22, 1881, Feb 20, 1883, Sept. 18, 1883. Patents applied for.

N. B.—We are and have been ready at any time to make a competitive trial against the Triumph, or any other Concentrator for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Co.,

Room 7—No. 109 California Street, - - - SAN FRANCISCO, CAL.

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1850. 1885.

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PLANTS FOR GOLD AND SILVER MILLS, embracing machinery of **LATEST DESIGN** and **MOST IMPROVED** construction. We offer our customers the **BEST RESULTS OF 35 YEARS' EXPERIENCE** in this **SPECIAL LINE** of work, and are **PREPARED** to furnish from **SAN FRANCISCO** or **CHICAGO**, the **MOST APPROVED** character of **MINING AND REDUCTION MACHINERY**, adapted to all grades of ores and **SUPERIOR** to that of any other make, at the **LOWEST POSSIBLE PRICES.**

We are also prepared to **CONSTRUCT** and **DELIVER** in **COMPLETE RUNNING ORDER**, in any locality, **MILLS, CONCENTRATION WORKS, WATER JACKET SMELTING FURNACES, HOISTING WORKS, PUMPING MACHINERY, ETC., ETC.**, of any **DESIRED CAPACITY.**

WATER JACKET SMELTING FURNACES

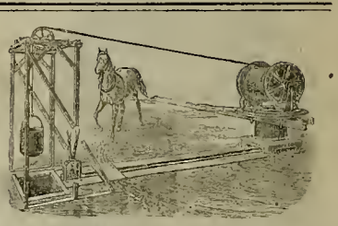
For **COPPER** and **ARGENTIFEROUS LEAD** ores of **NEW** and **ORIGINAL DESIGNS**, covered by **LETTERS PATENT.** No other Furnace **CAN COMPARE** with these for **DURABILITY**, and in **CAPACITY** for uninterrupted work. **MORE THAN 150** of them are now **RUNNING** in various parts of **THIS COUNTRY**, as well as many in **FOREIGN COUNTRIES**, giving results **NEVER BEFORE ATTAINED** as regards **CONTINUOUS** running, **ECONOMY** of fuel, **AMOUNT** and **QUALITY** of **BULLION** produced. These **CLAIMS** have been **PROVEN BY RESULTS** in **ANY NUMBER** of **INSTANCES**, and the **GREAT SUPERIORITY** of this **SYSTEM** of smelting ores **DEMONSTRATED BEYOND QUESTION. COMPLETE PLANTS** furnished to order of any **CAPACITY**, with **ALL IMPROVEMENTS** that experience has **DEMONSTRATED** as **VALUABLE** in this class of work.

WATER JACKET SMELTING FURNACES

THE DUNCAN CONCENTRATOR

Beyond question the cheapest and most effective machine of the kind now in use adapted to all grades and classes of ores.

This machine has been **THOROUGHLY TESTED** for the past **TWO YEARS**, under a **GREAT VARIETY** of **CONDITIONS**, giving most **EXTRAORDINARY** results **FAR IN ADVANCE** of anything **EVER BEFORE REALIZED.** A recent **COMPETITIVE TEST** at the Carlisle Mine in Mexico, showed an **ADVANTAGE OF OVER 30 PER CENT** in favor of **THE DUNCAN.** The amount **SAVED OVER THE FRUE** being sufficient to **PAY THE ENTIRE COST** of the machines **EVERY MONTH OF THE YEAR.** One of its **MOST VALUABLE** features is as an **AMALGAMATOR.** It saves all **THE AMALGAM GOLD** and **SILVER** that **ESCAPES** the **BATTERIES, PANS** or **SETTLERS**, making the machine worth **MORE** than **ITS COST** for **THIS PURPOSE ALONE.**



Baker's Mining Horse Power.

Possessing all the requirements of a first-class hoist, and affording means for the continuous operation of a Pump or Blower, without interfering with a hoisting apparatus. It is made entirely of iron, no piece weighs over 300 pounds. At the ordinary speed of a horse, a 1,000-pound bucket of ore may be raised 120 feet per minute. The hoisting-drum is under the complete control of the man of the shaft, and is capable of carrying 500 feet of five-eighths steel rope SEND FOR CIRCULAR.

HOISTING WORKS.

FOR SALE—TITLE U. S. PATENT.

A one-half interest, or the whole, of a valuable GOLD MINE, situated in the Quartzburg Mining District, Mariposa County, Cal. This Quartz Mine prospects from $30 to $90 per ton in gold upon the pay streak, and will pay $15 per ton, average, for all the ores. It is a 3-foot ledge, and a double compartment shaft is now down 200 feet. A mill and reduction works are now well under way; a boarding-house completed, and a water ditch, and a large part of the machinery bought and erected; roads made, etc. The only reason for selling any part is, that the owners lack sufficient means to put the property into productive shape. For further information address, GILBERT CLEMENTS, 313 Front St., San Francisco.

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INVENTORS on the Pacific Coast will find it greatly to their advantage to consult this old, experienced, first-class Agency. We have able and trustworthy Associates and Agents in Washington and the capital cities of the principal nations of the world. In connection with our editorial, scientific and Patent Law Library, and record of original cases in our office, we have other advantages far beyond those which can be offered home inventors by other agencies. The information accumulated through long and careful practice before the Office, and the frequent examination of Patents already granted, for the purpose of determining the patentability of inventions brought before us, enables us often to give advice which will save inventors the expense of applying for Patents upon inventions which are not few. Circulars of advice sent free on receipt of postage. Address DEWEY & CO., Patent Agents, 252 Market St., S. F.

NOTICE

Is hereby given that a meeting of the stockholders of the Lord of Lorn Gold and Silver Mining Company (a corporation) will be held on the 11th day of May, A. D. 1885, at one o'clock P. M., at the office of said corporation, in room No. 6, in building No. 318 Pine street, in the City and County of San Francisco, California, for the purpose and with the object: First, of increasing the capital stock of said corporation, so that the whole amount or par value thereof shall be $10,800,000, divided into 108,000 shares of the par value of $100 each; and, Second, to repeal the by-laws of said corporation, or any part thereof, and to amend the by-laws, or to adopt new by-laws therefor, as said meeting may determine. By order of the Board of Directors and Trustees, and of the President. March 7, 1885. JAS. T. McDOUGALL, President.

R. N. VAN BRUNT, Secretary.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, APRIL 4, 1885.

VOLUME XLXX
Number 14.

The Efficiency of Centrifugal Pumps.

We publish below a report by Mr. J. C. Pierson, C. E., Surveyor of Sacramento County, respecting the performance of a pumping plant erected by the San Francisco Tool Company for the San Francisco Savings Union, both of this city. The pumps were constructed under instructions from Mr. P. J. Van Lohensels, the agent of the Savings Union, and were erected on the Pierson district, 25 miles below Sacramento, near Walnut Grove.

The pumps are of dissimilar character, one being of the turbine, or enclosed runner, type, the other of the Gwynne type.

Mr. Pierson was a neutral agent in the tests, acting by consent of both the San Francisco Tool Company and Mr. Van Lohensels. No one representing the Tool Company was present at the tests, which were conducted by Mr. Pierson alone.

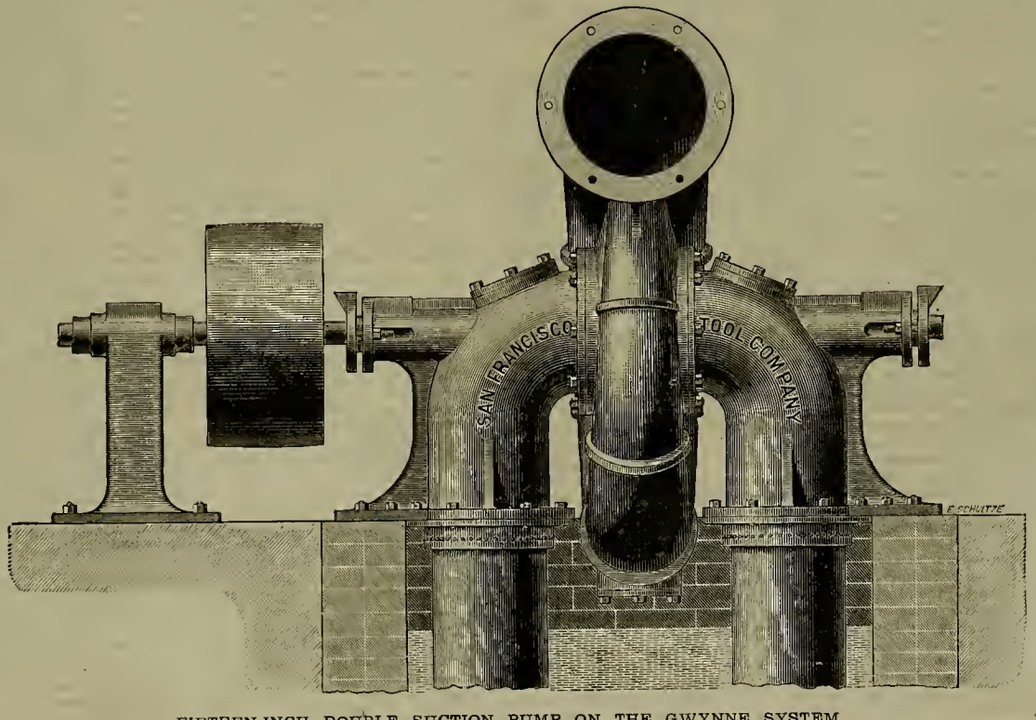
The table, aside from the valuable information it contains in an engineering way, discloses a higher duty for pumps of this class than has hitherto been thought practicable, about 75 per cent of useful effect.

Messrs. Gwynne & Co., of London, the most celebrated and extensive makers of this kind of machinery in the world, have attained an efficiency of 67 per cent in some cases, but with machinery constructed with the greatest care and costing twice as much in proportion as that referred to in the report. It should be explained that the 12-inch turbine pump referred to is one wherein there is centrifugal action alone, there being little or no effect from mechanical impact. The efficiency declines as soon as the flow of water has passed a speed of 10 feet per second, or the pressure much exceeds that due to the head. The Gwynne pump, on the contrary, employing direct impact, can be forced to any degree without the same proportionate loss of power. The tables will show this in the separate tests at different speeds and pressures.

The San Francisco Tool Company propose soon to conduct some careful tests with what are called "Torrent" pumps. These are a recent invention and operate without pipes or valves, and it is fully expected that an efficiency equal to that in the Parsons' experiments will be obtained—not the maximum of 80 per cent, which has always been questioned, but 75 per cent or perhaps a little more under a moderate lift. The efficiency of centrifugal pumps diminishes with the head or lift for obvious reasons.

Considering the water ducts from the inlet to the discharge as being of uniform area, it is evident the greatest efficiency is attained when the velocity of the water is uniform or is slowly changed. In high lifts this uniformity of flow is disturbed or destroyed by the higher speed of the runner required and the relative reduction of velocity through the runner. Otherwise the discharge would increase with the head, a thing not in accordance with facts, and disproved by all experiment.

The San Francisco Tool Company have constructed pumps to work successfully under a head of 80 feet, and in one case in El Dorado county a single runner pump drives water 115 feet high. We publish an engraving of the 15-in. Gwynne pump referred to in the tables,



FIFTEEN-INCH DOUBLE SUCTION PUMP ON THE GWYNNE SYSTEM.

The district drained by the pumps contains 8,700 acres, and is enclosed by a levee fifteen and a half miles long. The whole of this vast tract was kept clear of water during the great freshets of January last, working most of the time against a head of 14 feet. The whole of the district is under cultivation at this time.

Mr. Pierson's report is as follows:

SACRAMENTO, CAL., March 2, 1885.

To the San Francisco Tool Co., First and Stevenson streets, S. F.:—In answer to your request of the 12th ult. I herewith transmit to you the result of the measurements made in February last, of the volume of water discharged and the power consumed by the pumps in the Pierson Reclamation District. The pumping plant, as you are aware, is for drainage purposes and consists of one 12-in. Turbine pump and one 15-in. Gwynne pump, the motive power being a 12x24 engine, "Myers Cut-off." The reservoir or basin used for the purpose of collecting the seepage and rain water, covering an area of about 300 acres is distant from the pumping station about half a mile; the water being conducted to the pumps by a ditch of nearly uniform cross section, but of such limited size as to cause a variation of the height of the water in the sump with each variation in the volume of discharge, consequently the head or height through which the water is raised to the discharge pipe varies with the volume. The amount of water discharged by the pumps in a given time was ascertained by a series of gaugings of the ditch leading to the pumps, the mean of three or more tests being taken as the volume of discharge for that time, the speed of the pumps remaining uniform during the trial. Simultaneously with these gaugings, cards were taken from the engine by means of a Richards indicator, from which the gross power exerted by the engine was computed. Subsequently cards were taken of the pumps running empty, *i. e.*, not primed, and also friction cards of the engine. Deducting these from the gross power and the power consumed in lifting the water and driving it through the discharge pipe was arrived at. In the following table each measurement numbered one, two, three, etc., is the mean result of three trials:

No.	1	2	3	4	5	6	7
Water area of Ditch in sq. ft.	19.36	12.50	14.80	34.40	20.58	33.30	30.70
Mean velocity of Flow in ft per second.	1.77	2.90	2.44	.30	.77	.40	.80
Volume of Water discharged in gallons per minute.	15421.4	16312.5	16250.4	4644.0	10232.3	5594.0	11070.0
Head or height to which water was raised in feet.	8.0	9.0	8.65	6.4	6.9	6.5	7.1
Equivalent in H. P. of weight of water discharged per minute.	31.15	37.07	35.50	7.50	17.83	9.83	19.85
Gross indicated H. P. of Engine.	55.86	62.93	54.66	18.20	40.66	24.35	40.12
Net H. P. after deducting friction	43.86	50.93	42.66	12.20	28.56	18.35	37.12
Speed of Engine in revolutions per minute.	86	91	88	84	84	92	80
Per cent of power realized in actual weight of water lifted.	.71	.728	.83	.614	.624	.535	.54
Velocity of water in suction pipes in ft. per second.	14.5	15.4	15.3	13.1	14.5	16.56	10.90
Size and number of Pump.	Both Pumps.	" "	" "	Single No. 12	" " 15	" " 12	Both Pumps.

I am not prepared to draw conclusions from tabled results must be considered as so much this single series of tests, owing part to the fact that the results having been worked out subsequent to the trial, and having had no opportunity of since extending the trial, I am unable to reconcile some apparent differences; and further, owing to the fact that test 2 was the maximum capacity of the ditch to supply the pumps with water, no extreme in respect to velocity *vs.* power could be reached. Again, the fact that the runners of the two pumps run at different velocities makes the matter of conclusions more complicated. Therefore, these preliminary data to be used in connection with further data to be obtained hereafter. In this respect they may be considered valuable as being perhaps the first measurements of volume and power where accuracy has been aimed at of this form of pumps.

Most respectfully yours,
J. C. PIERSON, C. E.

Metallurgical Works.

The lead refining and desilverizing business has developed into very large proportions in this country. The only two mining companies which do their own refining, are the Richmond, of Eureka, Nevada, and Horn Silver, of Utah, the latter having extensive refining works at Chicago. In addition to these, there are the Germania Works at Salt Lake city, Pueblo Works at Pueblo, Colorado; the Omaha, Kansas city; Aurora, (Illinois); St. Louis, Chicago and Pittsburgh Works; the works of Balbach & Co., Newark, N. J.; the Manhattan, and the Crooke Works at New York, Nathorp Refining Co. at Nathorp, Shaffer Co., Colorado; and Selby Lead Works at San Francisco. The latter named works, for many years situated at North Beach, in this city, are to be removed shortly to a point on the bay shore, near Vallejo junction, in Contra Costa county, alongside the overland railroad track. For many months workmen have been grading and preparing the site for the new plant. The establishment will be much enlarged and improved, and have better facilities for carrying on its work. There is a wharf for vessels immediately in front of the works, and the railroad tracks are in the rear of the buildings, so that the transportation facilities are good. The Selby Company will have its own steamer running to the works. A good deal of the old plant will be removed to the new site and many new appliances will be added. The works will run night and day, an electric lighting plant having been put in to admit of this. The many years' experience in the business will enable the works to carry on the various branches in the best manner, and the extension of their facilities cannot fail to be of benefit to the mining interest of this coast.

LOCAL incorporations disbursed $287,780 in dividends in March as follows: Gas and water companies, $51,000; insurance, $8,000; powder, $15,000; street railroad, $17,650; mining, $194,930; miscellaneous, $1,200.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Cannot Let the Mining Law Alone.

EDITORS PRESS:—It was stated some weeks ago in the pages of the PRESS that a memorial and joint resolution had been presented to Congress praying that our mining law might be so changed that $50 paid into the school fund of a State or Territory would commute the $100 expenditure for labor as now required. The particular Legislature from which this memorial emanated was not mentioned, but it may be assumed to be that of some State with a depleted school fund, and not at all anxious to be publicly just, provided it can only serve its own petty ends. Why will not agitators and political schemers let our excellent mining law alone?

It is working satisfactorily for all who are relying on mining as a legitimate business. Under the law as it is now, a centless prospector or miner can by his own labor preserve his title to mineral lodes he has gone out into the mountains to discover, even at the risk of losing his life from Indian bullets. He may have held such lodes for years, and may hold them for years more, but who will dare to say that it is not just and right he should hold them as long as he meets the requirements of federal law? If the iniquitous change as proposed in the memorial and resolution referred to were effected, not one prospector in twenty would be able to comply with its requirements. What would he the result? The claim-owner would relocate his ground at the end of the year, and let the school fund of his county or State remain empty. But just then, it is supposed, the capitalist would come to the front, and laying claim to abandoned lodes would go on year after year paying $50 for each to help the public schools.

The ordinary capitalist is very rarely a fool, and hence he frequently refuses to take even a present of an unprospected mining claim. He knows too well by experience that it is judicious labor which gives value to a mineral lode to throw his money into a school fund under the pretext that he is holding mining ground. The "tenderfoot" speculator might want ledges of that sort, but he would soon tire of paying $50 a year for each, without any improvement being effected by work. The annual labor of the prospector will not develop a lode, but it frequently proves whether it is worthy of more extended efforts or ought to be abandoned.

There is a sort of under-current swaying green speculators, and silly legislators, too, as it now appears that the days of the pioneer explorer are numbered. They suppose that he has performed his part in finding lodes, but they deprecate his sitting down by them to wait for a cash reward. As long as the present mining law is in force the prospector who is able to work cannot be despoiled of his treasures. If the law were so modified that the tenacious, successful discoverer could be ousted from his claims, there would be rejoicing in some quarters from which only the flash of covetous eyes comes now.

Within the last five years several attemp's have been put forth with the very end in view I have indicated. Again and again the MINING PRESS has successfully checked these wily raids. The present attack from a paltry Legislature will amount to nothing, but it ought to warn the mining community that in order to maintain inviolate our really effective mining law, there must on its part be constant vigilance and a readiness to battle for its rights.

A PROSPECTOR.

Cochise County, Arizona, March 28th, 1885.

Lively and Dull Times.

Is Gold King?

EDITORS PRESS: I have recently read the admirable and earnest article written by Mr. A. B. Paul, and published in your issue of March 7, 1885.

His position, loosely stated, is that gold being king, we want plenty of gold, that we may have a strong and vigorous king. In two places he regrets the fact that "things are as they are," admits that in some way, society is a living error, but maintains that it is best, nevertheless, to make the error a *lively* one.

General Grant once said, "If we have a bad law, let us execute it vigorously; its evils will all the sooner appear, and it may the sooner be repealed." On that ground, the proposition of Mr. Paul would be, and is, a practical one. Let gold and silver be placed before and in the hands of the people, in any quantity, and, as in bonanza times, everything would be lively; but the liveliest process in operation, as then, would be the concentration of gold and silver, and other real wealth, and the sources of wealth, in the hands of the few. When, so rapidly and universally, did the fortunes of the moderately wealthy of this city and State, go into the hands of the few as in bonanza times, as when during a series of years, the Comstock and other mining camps, were manipulated in every possible manner to throw their entire product in the hands of a few prominent operators? And this would now be the result, were the whole silver belt put under the immediate process of resurrection.

The mines would be opened by capitalists, all the percentages of profit, even the miners' wages would, by devious paths and pernicious processes, which are to-day in legal operation, be turned into the already groaning coffers of the men and the class who, to-day, more than all others combined, stand in the way of beneficial production and progress. Their capital would be enormously increased, and looking for new investments, it would fasten on the most fundamental and productive elements of bargain and sale, land and water, land and water privileges, transportations, manufactures and staple commerce; and more than *ever* these would be concentrated in the bands of a few, and more *firmly* than ever a privileged class would become fixed and settled upon the country, and more than ever would the laboring classes become the unresisting slaves of the capitalistic lords and the subjects of the Gold King, whose rule has never been any too merciful.

It is an erroneous impression which many have, that "lively times" constitute good times; good, in the sense that every man secures the results of his own handiwork, sits under his own vine and fig tree unmolested, undisturbed, unplundered. "Lively times" are those times when pre-eminently the profits which should be enjoyed by the producers are being transferred from the pockets of the many to the pockets of the few with the greatest possible rapidity. From 1879 to 1882-83 times in the United States were comparatively lively. Jay Gould, and Vanderbilt, and hundreds of others during that interval piled up their tens of millions. From less than a million of men who were out of employment previous to 1879, the number has been increased to about two million, at this date with two or three more years of "dull times" yet to hear from.

In all probability before another revival of trade sets in, such as come every few years, two and one-half or three millions will be out of steady employment. It is no time to judge of the results of "lively times" until they are gone, and the subsequent period of depression and dullness has well nigh come to an end. At this particular point, when all the debtor class have liquidated or, have been fleeced; indeed, when the shearing time, for the producing industrial classes has passed, then can be determined the result of the previous lively years, active with business and enterprise. Then it will be found that the wool is in the hands of the shepherds or money kings and the sheep are shivering in bleak March and April winds, compelled to throw their energies into another period of lively commerce, trade and manufacture. Not only compeled but ready *from* sheer want to accept any wages; merely because they are enabled by their labor to supply their necessities, which recently they have been barely able to do, and secure themselves and families from starvation, ready to join as chorus singers in the tune of good times arranged and pitched by the men who have reduced them to the level of poverty and borders of distress, and who under the noise of the anthem which they have started anew, intend anew, to carry on the old process of concentration of values into their own hands.

With Mr. Paul, if I understand him, I believe we want more money to facilitate productive operations; but money, which originates from the Government, made of imperishable but cheap material, is the bravest, strongest money—better than gold and silver, which in times of danger, as at the beginning of the war of rebellion, shrinks away like a coward, and leaves the machinery of exchanges unlubricated.

Gold and silver are well enough in their way as articles of merchandise, as are other valuable metals; but as a basis of circulation have not one-tenth the value that the national credit backed, not only by the gold and silver, but by the entire wealth of the nation, would have as a basis of circulation.

I regret to differ with so intelligent and sincere a gentleman as Mr. Paul, and I am willing, in the long war for the rights of humanity still ahead of us, to take, as he seems to propose, any small advantages which may be secured, provided they are in the right direction; but this cry for "lively times" and the means to bring them about, means only another season of concentration of the real wealth of the world into still fewer handst; he breaking down of weak individuals, small partnerships, and pigmy and recent corporations, and mapping the wrecks of their fortunes into the hands of the stronger concerns.

Business being conducted on the principle of a *race*, the more racing we have the stronger the successful become, and the weaker and more discouraged, abject and servile, those who always come in second and last best, while this system, which has no basis of humanity underlying it, cannot be at once changed, and if it could be, a sudden change would not be wise. It is well for all to begin to understand that much that we complain of is caused by a system which has in it the elements of periodical distress, and ultimately, of unbearable oppression.

If a dozen children collected some afternoon to pull candy, and if after the product was completed three or four of them by virtue of superior prowess and assumption of skill and wisdom, should confiscate, by law, seven-eighths of the whole amount to themselves, it would fairly represent our boasted system of economy with its results on mankind; results which become more marked year after year, by a progressive ratio.

As in this children's work, there is now a system almost universally co-operative so far as production is concerned; but the distribution is like the handle of a jug, all on one side, determined by the sense of justice and selfish instincts of a few, and of course generally in their own interests.

Systemize co-operation under some general control—a co-operation of equitable distribution, as well as production, which latter is even now well-nigh general, and the vast map of economic troubles which at present are tossing the civilized world on the financial rack, will disappear to return nevermore.

Then, all the gold and silver dug from the eternal hills, will carry to humanity everywhere its blessings untrammeled and unalloyed.

W. N. GRISWOLD.

"Mineral Wax."

J. E. Clayton contributes to the *Engineering and Mining Journal* the following information concerning the "mineral wax" or ozokerite deposits of Utah:

The paraffine oil shales are found in the east flank of the Wahsatch range, the south flank of the Uintah range, and the west flank of the Colorado portion of the continental divide, or the Rocky Mountain range, especially that portion of it north of Grand river. These beds are probably Miocene Tertiary, and at one time undoubtedly covered the entire area of the great inland sea now known as the sandstone country of Utah, Colorado, Arizona, and New Mexico—a region about 400 miles in length from northwest to southeast, and 200 miles or more in width from northeast to southwest.

At the close of the Tertiary age, the elevation of the Wahsatch, Uintah, and Colorado ranges—especially that portion known as the San Juan mountains—gave a new outlet to the waters of this basin through what is now known as the Colorado canyon, one of the deepest gorges in the world. The vast flow of water during the "flood period" immediately following these great geological disturbances at the close of the Tertiary age—which, later on, merged into the Glacial epoch—gradually cut down this outlet, so as to drain out the entire basin. Then began the process of denuding the upper beds of the basin itself, by first cutting deep channels on the principal lines of drainage into the main outlet, and smaller ones later on, gradually extending back to the flanks of the surrounding mountains, until, at the present day, it is perhaps the most wonderful system of "box canyons" and deep gorges known on this continent or in the world.

Bituminous Shales.

The Tertiary shales have been swept away from all the central areas of the old basin; but in the higher plateaus along the flanks of the ranges, between the deep canyons, and even to the summit of the Wahsatch range in many places, these Tertiary oil shales are found covering large areas of country.

A peculiar feature of these oil shale beds is, that they are not equally rich in paraffine or wax. In some localities they are very thick, and rich in oil, but poor in paraffine, and the exudations along the flanks of the canyons are simply asphalt, with little or no paraffine. In other localities, the exudations are wax like and rich in paraffine; but I do not know of any locality where the wax exists in any considerable deposits. In all the localities that I have examined in the Wahsatch range, about the heads of Spanish Fork Canyon, and the heads of Price River (including White River and Fish Creek, its principal tributaries), the wax occurs as exudations from the shale-beds that have been cut by ravines so as to expose sections of the beds, or where they have been folded by the upheavals, and their edges exposed by denudation.

In studying the underlying as well as the overlying beds, I find, below the richest zone of shales, a series of compact beds, in places aggregating in thickness 100 feet or more, that are full of fresh-water fossils of the usual Tertiary type. The shells in some bands form the major part of the mass. The shaly portion is dark or blackish, in fresh fractures, and contains more or less oil. In some cases, thin splinters of it can be lighted with a match.

Overlying these fossil beds is a very fine clay shale with very few fossils in it, varying in thickness from 5 or 6 to 20 feet or more, which is very rich in oil, and, in some localities, rich in paraffine, both as impregnations and in very thin scales and films between the thin laminæ of the shales.

This upper bed of oil shale is remarkably tough. Weathered samples assume a grayish or brownish-gray color, and divide readily into thin sheets, and will warp in the sun like thin sheets of wood. There seems to be no sand or grit in them. One can saw them as readily as if they were boards. Above this is a continuation of what appears to be the same close-grained clay shale, of a dove color, many feet in thickness—say from 29 to 40 feet, but containing no oil or paraffine. The oil appears to have penetrated a few feet into this overlying clay shale from below, in some places impregnating it from 10 to 20 feet, while in other places not more than a foot or two.

Origin of the Ozokerite.

These facts seem to indicate that the oil is of animal origin from the underlying fossil beds above mentioned. Be that as it may, the facts are substantially as I have stated them.

Why these beds give crude oil and asphalt in some localities, and paraffine oils in other plac is a conundrum not yet answered. The h paraffine shales yet found are near the rim or ou edge of the old Tertiary lake or sea. He large lagoons or lakelets may have been fil with fresh water, and the vegetable slimes a mosses were sufficiently abundant to feed myriads of mollusca that became periodica entombed in the muddy ooze of the shall lakes or lagoons that were more or less isolat from the main body of water, thus giving m organic remains of the right sort in some loc ties than in others.

Ths facts seem to warrant the suggesti that the local conditions gave an abundant ty of organic life of the right kind in some plac while in other localities, the vegetable and a mal life produced oils almost destitute of par fine.

A careful investigation of the fossilifer beds underlying the different varieties of oil i pregnatious would throw some light on ths su ject. It might possibly reveal the true ori of all the fossil oils, as well as the causes th have produced the different varieties of oil the same zone of beds, only a few miles apa

Economic Values.

No deposits of "mineral wax" have be found in this old Tertiary basin, that equal richness or purity the ozokerite deposits of G licia in Austria. Such deposits may exist som where in this large stretch of the Tertiary be of the Rocky mountains; but they have not y been discovered. In the light of our prese knowledge, I am inclined to believe that t only way to get the paraffine in large quanti is to distill the shales on a large scale, by similar process to that now used in Scotlan The deposits of "wax" are small, and scatter over large areas of country. Hence, the colle tion of the impure varieties of ozokerite fou in Utah could not be relied upon to supply a considerable demand.

Systematic explorations by boring and othe wise may reveal rich deposits of the miner but this requires the employment of special sk and the expenditure of considerable sums money. All I can say about it now may summed up in this: That it is a promising fie for such explorations; but in my opinion, th distillation of the shales must be finally relie upon for the production of any large supply paraffine.

Dakota Coal Lands.

The following statement of the results of survey conducted by a party of the Unite States Geological Survey in the Great Sioux Reservation, Dakota, last summer, is made i answer to the many inquiries concerning th supposed deposits of that portion of th country.

The region west of the Missouri river, as fa as Slim Buttes, does not differ in general ap pearance from the settled portion east of th river. It is a plateau rising very gently wes ward, deeply cut by the valleys of the Gran Moreau and Cheyenne rivers and their tributa ries. This plateau is treeless and grassy, th monotony of its slightly undulating surface is ing broken only by scattered isolated butte from one to two hundred feet high. The large river valleys are a quarter to a half-mile wid with steep clay bluffs on either side, while th rivers flow in narrow cuts, with vertical bank ten to twenty feet high. Generally the wate is more or less alkaline, and occurs in the highe plateau only in water-holes. The soil of th plateaus for forty miles, and of the valleys fo 100 miles west of the Missouri, is of clay, vary ing in color from a dark bluish gray to blac "gumbo." Though essentially a clay soi throughout, west of this it becomes more sandy Timber occurs only in the cottonwood grove along the larger streams.

Coal.—Liguite occurs in thin beds of limite individual extent west of a line drawn from th forks of the Cannonball of the mouth of Cherr creek. It is possible that beds similar to thos mined at Sims, on the Northern Pacific R. R. may be found in the extreme northwest portion of the Sioux Reservation; such beds, if they ex ist, would furnish a poor domestic fuel for loca use. But within the area covered by the Geo logical Survey party—which includes the east ern part of the Fox Ridge—the geologist in charge found no coal of any kind serviceable fo domestic purposes, the lignite beds discovere being too thin and too dirty to produce a sal able fuel.

The area surveyed extends from the Missour river west to the Bismark territorial road, and from the Grand to the Moreau river. The geo logic formations carefully examined in this re gion extend south beyond the Cheyenne, and the observations apply to all other portions of the reservation south of it, including the Fox Hills. The reports of the existence of bitumi nous and anthracite coal in the Great Sioux Reservation are not borne out by the investiga tion conducted by the Geological Survey.—*Copps' Land Owner.*

THE Smelting Company engaged in leaching the tailings at Bullionville, Nevada, are doing very well. They are now working 12 ounce raw tailings up to 30 per cent, at a cost of $1.21 per ton. When the tailings are roasted which will be as soon as the company can erect a large Stedefelt furnace, Mr. Russell says that he will work them up to 80 per cent, putting through 175 tons daily, at a cost not to exceed $4.50 per ton. They have about 100,000 tons of tailings on hand.

MECHANICAL PROGRESS

American vs. English Machinery.

Mr. Arthur Rigg, C. E., one of the English engineers who visited this country last summer in company with the English scientists, is evidently a man of close observation, and one who is anxious not only to improve himself, but to impart instruction to his countrymen, from whatever source such information can be gained. Since his return, and at a meeting of the British Society of Engineers, held March 2d, 1885, he read a very lengthy and well written paper, giving in detail the result of his observations while in this country, and which appears in full in *Iron*, a leading mechanical publication printed in London.

It appears from this paper that nearly every branch of our manufacturing, and mechanical and mining industries was carefully studied by him, and his views are freely given. He saw but little to criticise, but much to commend. He was very decided in pointing out whatever improvements in method or manner of work he observed here, which he thought might be useful for adoption by his own countrymen.

In reference to the disinclination manifested by many to receive instruction or accept new ideas from foreign sources, Mr. Rigg uses the following words of wisdom:

"Some people seemed imbued with an idea that anything said in praise of either American or of foreign workmanship involves an unpatriotic distinction of what we produce at home. This is a very narrow view of things, for without having any sympathy with that cosmopolitan philanthropy which exalts every country at the expense of our own, it is plain that we can never indulge a generous ambition, nor aspire to lead the van of progress, if we shut our eyes wilfully to what goes on in the world around.

"There are no countries from which we can more fairly take example than those whose original habits came from this. America has been peopled by the more energetic of our own race, who now possess a country of marvellous internal resources. By the help of their laws, and to their enormous gain, new inventions are eagerly sought after, and talent meets great encouragement. There a man does not need to labor for many long years in perfecting an invention, taking the doubtful protection of those statutes of limitation called our Patent Laws, only at last to find his ideas appropriated by another—a pirate who takes undue advantage of the numerous pitfalls by which an inventor is encompassed. And for another reason, it is no wonder that foreign countries get ahead of us, when even their Governments wisely encourage every new departure, every improvement in existing methods. With them there is little of that nervous timidity about anything out of the beaten track, and none of that provoking interference due to the conceited half-knowledge of those who have learnt enough engineering to meddle with and spoil what they cannot understand.

"Abroad, engineers are more fully trusted than here, and they are therefore more free to obey the sound maxims—Make first sure of those general principles you intend to apply; then trust them implicitly; and, finally, never be afraid to carry them out."

We append in full his remarks in regard to the distinguishing characteristics of

American Machinery.

"The direct adaptation of tools to their intended purpose is very noticeable in all American machinery. In their planing machines, for example, everything is done to facilitate the attendant's labors by numerous little devices. The handles are arranged all ready for use; and, as the table runs quickly back, its catch strikes against an elastic lever, and so moves the narrow belt with the utmost quietness, and only about half the distance needed for an English machine. Then this action puts a friction pall into gear, and it deliberately advances the tool for another cut. The driving pulleys of these machines are ranged along the side, so they need not be placed across the line of main shafting as with ours, and, altogether, this one example might serve as text for a long dissertation upon the art of intelligent design, more particularly as contrasted with the clumsy planing machines which satisfy people here.

"Indeed, at one works the proprietor showed the writer an American machine for a different purpose, that was working well and with the utmost silence; while, not far away, was another doing corresponding work, and hearing the name of a large firm in this country. This latter was creating a deafening noise, and seemed as if concentrating its energies upon self-destruction every few minutes. A barbarous design, most appropriately named by its owner, as we left it, "Brute Force and Ignorance."

"In setting out manufacturing establishments of the best class in America, one cannot fail to notice that the object kept steadily in view is the need of cheap production with the disadvantage of expensive labor; and to this end the original first cost of machinery is considered of far less importance than any diminution of its productiveness, for that would be a continual drain upon profits. Settling the commercial aspects of any manufacturing concern may not lie strictly within the province of an engineer, but it ought to receive from him an amount of attention equal to its importance. That point where interest on first cost balances annual expenditure can be determined by very simple calculations, for if we assume capital all to be borrowed, and the machinery constantly in full work for fifty hours a week; and further, that a return of 10 per cent per annum just covers interest, repairs, and depreciation, then it follows that unless an investment gives more than 10 per cent it is not worth making. All excess over such interest becomes clear profit, and is frequently found enough to justify an opinion that no investment yields so high a return as first-rate machinery fully employed; and this is further illustrated by the old Lancashire saying that it is always worth investing $5,000 to save the annual cost of one man's labor.

"Those who commence doing everything which imperfect knowledge considers cheap are little aware how wide-spreading are the consequences of such an opinion being entertained by themselves and communicated to their workpeople. That idea not only saps the foundations of permanent success, but also poisons the springs of all honest dealing. It acts by the force of an evil example, and constantly depreciates the quality of manufactures. Many of our goods are already nearly driven out of foreign markets in spite of our immeasurable advantages, and are being replaced by the productions of America and foreign countries.

"If there is much to see and admire in Canada and the United States, there is nothing more worthy of imitation than the system which prevails there to so large an extent, of having the best of everything, whatever it may seem to cost—a system which ensures prosperity to trade, self-respect to the manufacturer, and one that is consonant not only with the sound principles of political economy, but also with ordinary common sense."

Cutting Steel Without Touching it with the Cutter.—We give herewith a new application of an old philosophical toy to a practical use. Make a disc of soft iron about 42 inches in diameter and three-eighths of an inch thick. Revolve this at a speed of 2,500 revolutions per minute. This gives a periphery speed of 25,000 feet. Against this edge a bar of steel, no matter how hard, may be brought and slowly turned. Care should be taken that contact does not take place, allowing "daylight" to be always visible between the disc and the steel; but the latter will be nevertheless cut by the soft iron. A stream of sparks is thrown off, which are hot enough to agglomerate as they gather in a small cone under the wheel. But like the glowing sparks thrown of from an emery wheel when grinding metal, these drops of apparently molten steel do not burn the hands, which may be held in the stream of steel sparks. A bar of steel two or three inches in diameter, whether rolled, polished or hardened, is cut through in a few minutes, and the operation does not heat it enough to draw its temper out.

Straightening Grate Bars.—It is stated by a correspondent of the *Scientific American* that ordinary grate bars, if not actually burned, can be brought back by heating the twisted portion to a very dull red, just enough to detect while in the fire; then nip the bar in a vise close enough to admit of its being shifted, bring a very gradual pressure on the other end with your hip, shifting the bar along so as not to take the warp all out at one place. The correspondent says that with one heat he has taken three or four inches out of a bar. A very little beyond the right heat will cause them to break like old cheese. The degree of heat and gradual pressure that twisted the bar without breaking is the remedy to bring it back. Judging from the tons of old grate bars which may seen about the foundries and old junk shops, it would appear that a very important saving might be made out of this new "shop wrinkle."

Power Wasted by Shafting Being Out of Line.—The amount of power wasted by shafting being out of line, badly lubricated, of insufficient size and imperfectly coupled, can hardly be estimated. Great as is this loss, that from badly laced, crooked, stiff, and generally outrageous belting is but little less. In some establishments a belt lacing of sufficient size for the main belt of the establishment is considered plenty good enough to lace a three-inch belt with, and is used accordingly. A punch large enough to make holes for the biggest lacing is, of course, necessary, and it has the advantage of answering for all sizes of belt: The apparent advantage of having but one size in a large establishment is captivating to the business department. The result in belt efficiency, however, is something which would astonish the coun ing house if it could be made to understand the figures—*Industrial American.*

Steel and Iron Girders.—Experiments on an extensive scale have been made by the Dutch Government to ascertain the relative strength of iron and steel girders. The soft steel girder proved to be 22 per cent and hard steel girder 66 per cent stronger than the iron girders. It was pretty well established that the strength of steel girders is about the same for the two flanges if they are made alike in section.

A good mechanic advises machine operators never to put resin on a new belt.

SCIENTIFIC PROGRESS.

The Grand Forces of Nature.—A grand exhibition of one of the levelling processes of inanimate nature was witnessed in the vicinity of the Homer group of mines, south wall of upper Mill Creek Canyon, on Friday afternoon of last week. Jasper Parrett, who is doing some work on the Homer group, was climbing the wall by the Homer trail, and had just emerged from the narrow gorge, through which the trail passes, about 1,700 feet up from the creek, when a great obtruding dyke of greenstone dropped from a beetling cliff nearly 2,000 feet above him, broke into huge blocks and came leaping and thundering down the nearly vertical declivity toward him. Mr. Parrett had barely time to escape over a field of compact snow clinging to the steep mountain side, and had the slide taken place while he was climbing through the steep and narrow gorge just below he must inevitably have been killed, as the flying mass raked both walls from end to end of the gorge. Some of the blocks, leaping several hundred feet down the mountain at a single jump, would strike upon a hard snow bank and hurl clouds of snow hundreds of feet into the air, and one block, which weighed perhaps not less than one hundred tons, ran clear down into Mill Creek, a distance of about 4,000 feet, or nearly one mile.

How Serpents Climb.—The movement of a snake in climbing a perpendicular surface, as I have observed, says a writer, is a vermicular, undulating motion, not spiral but straight up the face of the surface. I have seen a black snake thus glide up a beach tree with that easy, careless grace of movement which is characteristic of that snake when moving over horizontal surfaces. The bark of the beech affords few inequalities into which the edges of the gastrosegal hands could he thrust claw-fashion, and I have no doubt that atmospheric pressure is the force that holds the snake against such surfaces in climbing, sucker fashion, as the boy lifts the brick with the piece of wet leather. I once knew a black-snake to ascend a stucco wall to the eave of a carriage house to the swallows' nest; straight up the up-and-down boards. I have seen them glide from tree to tree and loop down near the top of large trees, but never saw one descend by climbing down a smooth perpendicular surface. I have no doubt of their ability to do so, however. I do not believe that this power is enjoyed by the copperhead or rattlesnake, or any venomous sort with which I am familiar, they being heavy and sluggish in their movements. I have seen them go up on leaning trees and crawl into the foliage of bushes, however.

Apparent Enlargement of the Sun and Moon.—Every one has noticed that the sun and moon, in rising or setting, appear unusually large. Paul Stroobant points out the absurdity of the vulgar explanation that intervening objects enable us better to estimate the real size of the heavenly bodies, in that the same effect is visible at sea, and indicates the fallacy of several other theories. He believes that there are two real causes of the phenomenon in question, both purely physiological—one, the greater sensitiveness of the eye to angular magnitudes near the horizon; the other, a direct effect of the feebler light in the enlargement of the pupil, which, it would appear, tends to magnify objects, even when artificially produced. His theories are supported with numerous illustrations and experiments, the most interesting of which are to show that the distance between two luminous points within a room suffers the same apparent change as in the constellations, when, without altering the distance from the eye, the altitude is gradually increased; and the maximum augmentation is estimated in either case as about one part in four.

The Denudation of the Two Americas.—T. Mellard Reade, C. E., F. G. S., in his presidential address to the Liverpool Geological Society this session, "On the Denudation of the Two Americas," showed that 150,000,000 tons of matter in solution are annually poured into the Gulf of Mexico by the Mississippi river; this, it was estimated, would reduce the time for the denudation of one foot of land over the whole basin—which time has hitherto been calculated solely from the matter in suspension—from 1 ft. in 6000 years to 1 ft. in 4500 years. Similar calculations were applied to the La Plata, the Amazone and the St. Lawrence. Mr. Reade arriving at the result that an average of 100 tons per square mile per annum are removed from the whole American continent. This agrees with results he previously arrived at from Europe, from which it was inferred that the whole of the land draining into the Atlantic ocean from America, Africa, Europe, and Asia contributes matter in solution which if reduced to rock at two tons to the cubic yard would equal one cubic mile every six years.

Chemistry now affords the means of giving to marble a beautiful coloring of yellow, without any injurious effect upon the polish or hardness of the stone. Neutral chloride of iron is first dissolved in 90 per cent of alcohol, and, after gently heating the marble to be colored in an oven or over a fire, the solution in question is applied by means of a brush, a sprinkler, or even by pouring. The strength of the solution is, of course, proportioned to the depth of the color desired, and care is requisite, also, in regard to the degree of temperature. For the production of light tints it is considered preferable to apply very diluted solutions repeatedly. On the marble becoming perfectly dry it is moistened with water or exposed to moist air when the decomposition of the salt of iron takes place in the upper strata and the process of coloration is complete, all that remains to be done being to polish the surface, if necessary, or it may be simply rubbed off with a wet cloth.

Leather from Fish Skins.—Mr. Jacob Trungenwalt, of Philadelphia, has discovered that catfish skins may be tanned into elegant and serviceable leather. His first experiment was on the skin of a fish weighing about 160 pounds. He has now been engaged in the business for several years and finds it very profitable. The leather is used for anything, from shoe laces to slippers, cabas, pocket-books and fancy pocket case covers, etc. The leather is light gray in color, very soft, and Mr. T. says "Tougher than the hide of a badger." This hide fair to prove another profitable way of disposing of these skins, which have heretofore been used principally for the manufacture of glue and isinglass.

The Effect of Cold on Tin.—It is stated in a recent number of the *Comptes Rendus* that, according to Herr Fritsche, tin exposed at St. Petersburgh last winter to a temperature of forty degrees below zero was converted into a semi-crystalline mass containing cavities like basalt. In masses of tin weighing from fifty-five to sixty-five pounds, these cavities in some cases had a volume amounting to nearly twenty-four cubic inches. According to M. Dumas, facts of this kind are not new in Russia; for instance, in one case the pipes of a church organ were so altered by the cold as to be no longer sonorous.

Weatherwise.—By observing and comparing the sounds emitted by a telephone connected by leads with two iron bars, stuck into the ground a few metres apart, it is possible to have an indication of the coming weather, sometimes ten or twenty hours in advance. So says Le Franklin. In case of a thunderstorm especially, a noise like that of shriveling leaves increases until a flash of lightning occurs, when it resembles that of rain or hail falling on glass.

Palpitation of the Heart.—A French physician announces that distressing or excessive palpitation of the heart can always be arrested by bending double, the head down and the hands hanging, so as to produce a temporary congestion of the upper portion of the body. In nearly every instance of nervous or anemic palpitation the heart immediately resumes its natural function. If the movements of respiration are arrested during this action, the effect is still more rapid.

The Skin of Insects.—The skin or outer cover of the insect consists of the cuticle, not comparable with any part of the skin of a vertebrate, and underlying tissues. The cuticle consists of two very distinct layers—one thick and transparent, the other, in which also pigment is developed, thin and opaque. The pigment is disposed in beautiful microscopic markings, differing in different species.

A New Alloy.—*La Nation* gives the formula of a new alloy which is especially adapted to many important uses in the arts. It melts at the low temperature of 160° Fahrenheit, or considerably below that at which the magical spoons of long ago melted in a cup of tea. Its composition is: Bismuth, 48; cadmium, 13; lead, 19; tin, 20. The alloy will withstand severe pressure.

The Old-Fashioned Way Becoming Obsolete.—In the manufacture of leather the old-fashioned bark tanning process seems to have died out, judging from the amount of extract used. Another substitute for the ordinary simple ingredients used in tanning has just been used in Germany. It consists of a mixture of soap, rape-oil, yolk of egg and sal-ammonia.

Attraction of the Moon.—M. Poincaire contends that the attraction of the moon modifies the intensity of gravitation. Hence at the equator the clock is retarded by half a second yearly by the combined attraction of the sun and moon, and advanced a second at the poles.

The Light emitted by insects, when examined under the spectroscope, is very beautiful, but is without bright or dark bands. When the intensity diminishes the red and orange rays disappear, and the spectrum is reduced to yellow and green rays.

Improved Insulation.—The latest discoveries render insulation so perfect that today there is less loss of electrical force between the United States and England than there was formerly between New York and Brooklyn.

Land and Water.—The total superficies of the seas in the world is given as 231,915,905 square miles, and that of all the continents and islands as 34,354,950 square miles.

Bromide of Silver an Explosive.—According to the *Comptes Rendus*, bromide of silver in contact with heat is an explosive.

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Saturday Morning, April 4, 1885.

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Passing Events.

Reports came last week of rich gold strikes near Salt Lake City, but later advices from there do not confirm the richness. A few men are at work on their prospects, but there is no excitement.

The Wood River mining trouble continues. The men working in some of the mines have quit at the request of the Miners' Union. The mine superintendents, however, seem to remain firm, and insist that they will employ whom they wish at whatever wages they choose. Governor Curtis and General Brisbin have visited the mines to prevent trouble.

There is quite an excitement just now at the old Black Foot road, close to Helena, Montana, where several rich lodes have been found. The prospects are said to show up well. Some ground has even been taken up within the city limits of Helena.

A new trail is to be built from Weaverville, Trinity county, to the New River mines, which will make the time only one day between the two points. It is said the trip can even now be made from Weaverville easily.

Interest is now centered on the war news from Europe and Asia; and even nearer home there is trouble. In Guatemala Barrios is marshalling his forces, and at Panama revolutionists have seized on an American ship and officers.

ANTIMONY is selling in Liverpool at £39 to £40 per ton.

Iron-precipitation Process for Lead.

Whenever sulphur, arsenic, antimony and other electro-negative elements enter into the composition of a lead ore, we have to eliminate them before we can extract pure lead without difficulty. This is either done by precipitation by means of metallic iron or by roasting the ore. Of the latter method we spoke in this PRESS recently. The iron-precipitation process is only applicable to galena ores and lead ores contaminated with small quantities of the sulphides, arsenides and antimonies of other metals, to which should be added all sulphates, arseniates and antimoniates as they are reduced in the furnace to sulphides, arsenides, etc.

The process is based on the fact that iron has a greater affinity for the electro-negative elements than lead or silver. If, therefore, iron is brought in contact with molten sulphide of lead or silver it will, as soon as it has acquired the proper temperature, combine with the sulphur, while lead and silver are set free as reguline metals. The affinity of silver to sulphur is, however, stronger than that of lead, which is the reason why some sulphide of silver is undecomposed, remaining with the sulphide of iron.

The compound of iron and sulphur is metallurgically called a *matte*, while that of iron and arsenic or antimony is termed *speiss*. The latter has a higher specific gravity than the former, which is the reason why, if both are produced during the smelting operation, the matte floats on top of the speiss. The mattes retain more silver than the speisses, while with gold the case is exactly the reverse. Lead enters the speiss only in the metallic state in the form of shots, while in matte it will be present as a sulphide. Copper enters into either as sulphide and arsenide respectively, as it has a strong affinity for both sulphur and arsenic.

As it is not easy to obtain metallic iron in every locality, and as it is not generally in a proper shape for being weighed out and mixed accurately with ore and fluxes, it is preferable to supply the iron as a desulphurizer in its nascent state, in which it can be obtained by using a properly constructed furnace and working a slag of sufficient acidity, at the same time adding so much ferruginous matter to the smelting mixture as will correspond to the amount of metallic iron required for the saturation of sulphur, arsenic, etc. Basic slags are, according to O. H. Hahn, not good reducers, because they form at a temperature at which iron is not reduced; they will, therefore, merely mechanically dissolve the magnetic oxide which forms out of the additional ferruginous matter in the upper part of the furnace.

It may be inferred that this process is not a perfect one, because it gives rise to the formation of intermediate or by-products which contain gold, silver or lead. If thrown away these metals will be lost entirely. If we wish to extract them additional processes have to be resorted to, and the question then is, will it pay? It is, therefore, advisable to subject only such ores to the iron-precipitation process as contain a minimum of sulphur, etc. What the maximum should be can be determined by the local price of the iron flux compared with the cost of roasting.

American Machinery Still to the Front.

It is gratifying to know that although the first reports of American dredgers at work on the Panama Canal were detrimental to their reputation yet they have won their way, and against all foreign prejudice and opposition and have proved themselves far more effective than their costly and elaborate opponents, and are constantly at work, while the foreign machines are in the repair shop. These American machines were built in San Francisco, by the Golden State and Miners' Iron Works, after models which had been well tested in this State.

THE superintendents of mining companies at Wood River have peremptorily declined to hold any conference with the committee from the Miners' Union, stating emphatically that they will submit to no dictation as to how they shall conduct their business; that they will employ whom they please and pay such wages as they can agree upon with men whom they employ.

THE daily average amount of ore shipped from Gold Hill to the mills on the Carson river is 640 tons.

Electric Railways.

It is expected that in about a month preparations will have been completed by the elevated roads of New York for a test of electric locomotion on the Second avenue line. A central line will be laid between the rails from Chatham Square to the Harlem river terminus, to which electricity will be conducted from dynamos. This rail will be insulated, the present tracks remaining as they are. The expense of building the third rail will be divided among the electric railway companies, all of whom will be allowed equal facilities for experiments with the motors. A commission is to be selected by the companies to decide on the relative merits of the inventions, and after their decision a company will be formed to control all the patents for the several companies for this country, and for these rights each company will receive stock in the new company in proportion to the value of the property and patent rights conveyed by it. It is claimed that the regulation of the speed of trains will be less difficult with electricity than with steam, and that the trains can be stopped more quickly and be at all times under more perfect control. The noise will be less and the smoke and cinders will be avoided altogether.

The motors of the whole track will be under the control of one person, and the system will permit the trains to be of any desired length. Five cars can be controlled as easily as one. Air brakes will be used instead of the steam brakes now employed on the elevated railways, and there will be advantages in many ways. The distribution of the weight of the motive power will be an important one. The steam locomotives of the Manhattan Company weigh about 18 tons, but the new motors will increase the weight of each car perhaps not more than one ton, thus saving 14 tons of dead weight for each train. The new motors will weigh about eight tons. Its driving wheels will be four feet. The motor will be about twelve feet long and nine feet high. It will move an elevated train of four well-filled cars at any desired rate of speed.

In San Francisco, too, plans are being arranged for an electric railroad. Very shortly an experimental one, being built by the Pacific Coast Electrical Construction Co., will be running from the Southern Pacific R. R. depot to the new Union Iron Works, on the Potrero. It will be for both freight and passengers. This company is perfecting plans for more extended roads, as we remarked in an article a few weeks since: "The road is to be constructed in a manner exactly similar to the method of building cable roads, and the cars and dummies will also be similar to those on the cable lines. The power will be distributed from a central station, where the electricity will be generated by steam power. Underneath each track in a conduit will be a positive and a negative wire, through which will run a current of electricity from the generating machine. The lever of the dummy will have two arms below the track, and at the end of each arm will be a grip, which, when the car is in motion, will grasp the conducting wires, thereby closing the circuit. As soon as the car stops these grips will be lifted from the conducting wires, the circuit broken, and just so much energy as is necessary to propel a car thus be saved. The generating machine will be so arranged with cut-off and other appliances that as soon as a car stops the machine will cease to generate the amount of electricity necessary to propel one car. By this method if by a procession or any other cause the line is blockaded and half the cars are stopped, the generating machine will run at only half its usual capacity. The company claims that it can build its road for 40 per cent less cost than a cable road and run its cars 40 per cent cheaper.

Electric railroads similar to those proposed for this city have been in successful operation for over two years in Frankfort and Berlin, Germany, and for over a year at a place in Ireland, at Coney Island, at Menlo Park, N. J., and at Saratoga, N. Y.

THE Candelaria miners have called a meeting to consider the proposition of employing a competent physician and surgeon on the assessment plan. The idea is an excellent one, and its practical application would cause greater security to the safety of all in case of sickness or accident.

The Sutro Library.

Mr. Adolph Sutro, well-known to all mining men as the originator of the famous tunnel in Nevada, which bears his name, is engaged in a work which will perpetuate his name better than any monument would do, since practical results will follow. He is founding an immense library, which he will present to the city of San Francisco. We had an opportunity last week of examining the nucleus of the library, which is temporarily arranged at 107 Battery street. The library is intended to be mainly technical and scientific. The books so far here amount to between 60,000 and 70,000, while enough more are now on the way to make up a total of 150,000 volumes.

About a year ago Mr. Sutro was in Wurtemburg, when the Buxheim library was being sold. Buxheim is a little town, principally remarkable for its monastery founded in A. D. 1200, the monastery in its turn being noteworthy for its library of old and rare books. The library fell into the hands of Count Bassenheim, a spendthrift; the Count had to sell the library, or a bank sold it for him, and Adolph Sutro bought the bulk of it. Again Mr. Sutro was in Munich when the State library was being cleared of its duplicates, seized the opportunity and bought them. Within a comparatively short time he was in England when the sale of the Blenheim library was announced. He attended and bought many of the treasures there disposed of. Almost contemporaneously with this came the sale in London of Dr. Charles Clay's collection of Bibles and Sutro bought the entire accumulation of the eminent bibliophile. Beside himself purchasing at many other places in Europe, he has agents engaged in the same work.

A large portion of the books now here are very old and rare ones, culled from many libraries. Rare and curious editions, ancient manuscripts, old proclamations and edicts, illuminated missals, files of ancient journals, odd bindings, collections of autographs,—in fact everything is there to rejoice the lover of books. It would be idle to even attempt to enumerate a portion of the collection. The collection of Bibles is very full and curious, as many rare editions are seen.

Mr. Sutro's object in collecting these old books is to have a basis on which to build up complete sets on given subjects. More modern works can be obtained later, but such as he has now are more difficult to get. The collection is a wonderfully curious one, and months could be spent in merely looking at title pages, illustrations and bindings.

When completed the library will be one of great scientific value, as reference and text books on the various subjects will all be grouped. For instance, Mr. Sutro informed the writer that he had specially looked out for works on mining and metallurgy and had procured many rare ones. He will add those of modern times, and eventually have a complete and full group of mining books of every kind, which will show the advance of the industry from earliest times. The same is the case with botany and other branches of science; music, political economy, etc.

It is Mr. Sutro's intention to build in this city a large fire-proof building in which this vast collection of books will be stored for the benefit of the public. The present quarters are already filled, and as many more books have also been bought. His agents are constantly purchasing, and before long a most magnificent library will be the result. All lovers of rare books will be gratified to learn that arrangements are being made as rapidly as possible to place the books in a position for reference. Not even the famous Astor library of New York will afford such opportunities for scientific or historical research as will this one now being formed.

A STEEL STEAMER.—On Thursday of this week the first steel vessel ever built on this coast was launched at the Potrero. She was built by the Union Iron Works at their new ship-yard and shops. The launch occurs too late for us to give any description of it in this issue and it will appear next week. An interesting feature of the occasion was the placing of the engines in the vessel immediately after the launch; the new steam crane being used for the purpose. The whole thing was very successfully accomplished, and there was a very large attendance of representative citizens.

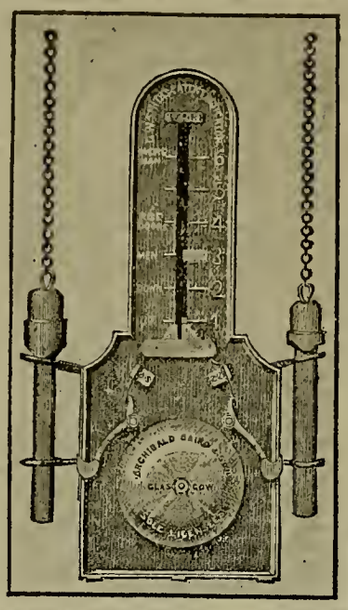
Safety Indicator for Shafts.

A new form of safety indicator for mining shafts has been brought out in England, which possesses the peculiarity of combining both a visible and audible signal with a safety guard for pit bottoms. The object of the indicator is to provide a safer and more effectual method of signalling between the "bottomer" and the engineer than at present in use, and at the same time ensure the entrance to the shaft being closed while the cage is in motion. The indicator consists of an iron frame about 33 inches high, fitted with a clear-rounding gong and hammers. An index pointer showing red, is lifted up to a corresponding number of bells rung by means of the ordinary pit-bottom lever.

The engraving of the appliance we take from the *Colliery Guardian*. When the "hutch" or "tub" is on the cage, and the protection bar or gate is put down at the pit bottom, the red danger signal of the indicator drops, and leaves behind a white signal at the same figure, a bell being rung by the same movement is the signal to "lift." After the work has been performed, and the opposite cage has descended, the act of raising the protection bar or gate to take off the return hutch or tub allows the white index to drop behind the red one. In short, when the pit is open and unprotected, the red signal is against the engineman, when the pit is closed and protected the red or danger signal is off, and the white signal shown at the required number. The whole work is done by the "bottomer," who has the indicator under his control. The following are a few of the advantages the indicator possesses: (1.) Only one distinct signal can be given at a time. (2.) The rising of the red signal with the simultaneous ringing of the gong shows the work to be done; the dropping of the red and "one bell" sounded, the time for doing it. (3.) Should two or more seams open into one shaft, and any protection bar or gate be accidentally left open, no signal to "lift" can be given till all the bars are down and the pit secured—it is a locking signal. (4.) Should any accident occur from wrong winding, the white index stands as an evidence against the man who made or read the signal wrongly.

The arrangements on the surface consist of the indicator erected in the engine-room, on a stand about three and a half feet high, as nearly as practicable in front of the engineman, the indicator being screwed down to stand and iron rests erected on each side. Into the rafters of the engine-house a six-inch pulley is screwed directly over each eye, at the side of indicator; the indicator weights are connected by light chains, which pass over the pulleys; and are connected with wiree from the pit-head hammers or cranks. The tongues on the pit-head hammers or cranks are fixed below the bare, and on the weighted side of the fulcrums or centres; the signal wire from the ordinary signalling lever at the pit bottom is connected with the weight on the left hand side of the indicator (looking at it from the front) the protector bar wire being connected with the weight on the right hand side. The stroke or travel of both weights must be the full space of the slots in side standards, and require regulating from time to time, till the wires are thoroughly stretched. The right hand weight is kept full down while working left one. When the fittings at the pit-bottom, hereafter described, are erected, the pit-head fittings above described are regulated by (1) holding up the "protection" bar hammer; and (2) working the signalling crank or hammer up and down. The loose wire, etc., are adjusted before working signals from the bottom—the "protection" bar crank or hammer is always up before a signal can be given, and when put down it cancels the signal.

The arrangements underground consists of "protection" bars of one and a half inch steam tubing placed across the various openings leading into the shaft. "Protection" bars work in hardwood journals, secured on the mid-wall side of the shaft; the ends of the bars project beyond the journal, and are turned up on one end, and fitted with a muzzle to take the wire. With glands in center of bar a circular disc of sheet iron, ten inches in diameter is fastened as a danger signal, and it is preferable to paint the whole a bright red. A light chain is attached to the disc, and passed over a pulley, weighted sufficiently to assist in raising the lever. A hook is in to hold bar up when required. The "protection" bar falls when relieved to horizontal position. Where gates already exist at entrance to shaft the protection wire should be connected to it in same manner as for a bar. The muzzle on end of all the "protection" bars in the shaft should be connected by a branch wire to the main wire; only one wire is required the whole way up the shaft for any number of "protection" bars or gates. The bars should be placed high enough to stop a hutch or tub, and rest on blocks when down.



Registering Apparatus for Mine Shafts.

The following are directions for working. Signals can only be given by observing the following order:

Signal at bottom,	Result in engine room.
First, Lift up "protection" bar	Cancels last signal made.
Second, Signal message..	Danger signal up at number
Third, Put down "protection" bar.	Danger signal off—white one at number

and so on, keeping this order in signalling. When "pit" is open "danger" signal is exposed. As engineman won't "lift" till "danger" signal is off, all bars must be down before the cage leaves the bottom. To disconnect indicator lift both weights out of eyes of indicator and secure them. Written or printed instructions should be posted at each bottom or engine-room, as follows:

Instructions to Engineers.—When pit bottom is open red or "danger" signal is shown. When white is shown, bottom is protected. Dropping the red is the signal to "lift." The index pointer should correspond with the number of bells rung. The white index registers the signal till the work is done. To stop the cage after starting, the bottomer signals one, and then makee new signal.

Instructions to Bottomers. — "Protection" bar *must be up* when signal is made. Putting down "protection" bar drops the "danger" signal, and is signal to lift. All bars in all seams must be down before signal to lift can be given. To stop the cage, signal ons with bar down, then raise bar and make new signal.

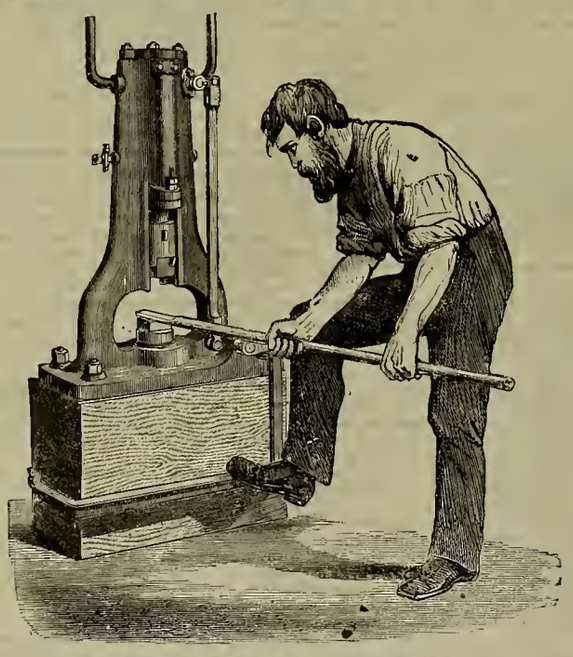
New Mexico Copper.

In New Mexico copper occurs abundantly in many counties. For years the Mexicans and Indians have brought very rich specimens of copper ore from the Jemez and Nacimiento mountains. It was known that there was a rich body of mineral there somewhere, but no systematic effort was made to discover it until 1880. A fine property was found on the west side of the Nacimiento mountains. The copper occurs as copper glance and gray copper in the ledges of sandstone. A small amount of silver is found with the copper on the surface, and seems to increase with the depth. The Nacimiento company now own over a dozen claims, on all of which large deposits are found. At a distance of 50 feet from the surface a large vein of conglomerate, 12 feet wide, averaging 25 per cent copper, was struck. The Copper Queen shows a smaller vein, but is much richer. It runs over 50 per cent, and parts of it as high as 60 per cent. In all of these mines there is ore that will run 40 per cent copper.

The Santa Rita copper mines are five miles from Fort Bayard, which lies between the town of Central City and the copper mines. The Santa Rita mines are peculiar. They are not veins or lodes. In sinking a shaft the miner meets with veins or sheets of native copper, from one-eighth to two inches thick all through the rock. Sometimes nuggets or boulders are found.

Chinese Coal Mines.

The Chinese are laying aside their prejudices in a new direction, and intend to work their coal mines in a systematic manner, with the most experienced European miners. The Chinese Government has applied to the great John Cockrell Co. for 30 miners to superintend the extensive collieries which they propose to open up in certain of the rich deposits already "prospected." Very liberal salaries have been offered, and the appointments have been eagerly accepted. These 30 miners thus officially engaged are likely to be followed by another 30, who will proceed to China on the chance of obtaiuing an engagement on their arrival. As the former will probably be glad to avail themselves of European aid, there is hardly a doubt that the latter will speedily obtain the appointments they desire. It is probable also that the Chinese will obtain a plant of the necessary machinery to work their mines properly. But they will soon learn the ways of the "outside barbarians," and in opening up these other mines will adopt the system they learn and not call in the aid of Europeans. In this the Chinese are very expert. Our experience with them is that they learn things readily, and then conduct matters themselves, the trade or occupation once learned. There are large deposits of coal in China, and with the assistance referred to they will very quickly be developed so as to be of more importance than heretofore.



STEAM HAMMER FOR LIGHT WORK.

An Improved Steam Hammer.

The accompanying illustration represents a class of steam hammers now imported by H. P. Gregory & Co., Nos. 2 and 4 California street, S. F. They have in stock constantly two sizes, viz., the 55 lb hammer, which is now being used on this coast in welding up iron to 2¼" in diameter; and the 110-lb hammer, which is equal to work 3" and over. They are built entirely of iron and steel; the blows can be varied in strength and speed at the will of the operator. No attendant is required in their use other than the forgeman, the valves being operated by a treadle.

The utility of steam hammers is recognized, but the general impression exists that it is only large establishments, or those establishments doing heavy work, that can make them profitable. This idea has probably arisen from the fact that steam hammers have from the first, until very lately, been of the heavy order, and necessarily expensive in their first cost; this objection is now met by the manufacture of these 55-lb and 110-lb hammers. They take little space; prices are within reach of all, and their adaptation to every form of work complete.

Their uses are applicable to the lightest description of forgings, such as are usually made by hand, as well as for heavier work. In consequence of the almost endless variety of purposes to which they are adapted, these steam hammers are economical even in the smallest shops with only a single fire, and indeed none can afford to be without one. The principal advantages derived are:

First. A great saving in wages, as one smith with a steam hammer can do as much as two or three without it, and for these sizes he will need no assistant, as the hammers are worked by the foot.

Second. Great economy in fuel, as at one heating of the iron so much more can be done than is possible by hand.

Third. Economy in iron, since scraps, old shafts, etc., which commonly are almost useless, can be worked up into forgings of the very best quality.

Fourth. The forgings are more accurately finished, and require less labor in fitting and turning than is possible to attain by hand work.

In many cases the saving by the use of these steam hammers amounts to fully 50 per cent, defraying the cost of the hammer in a few months.

These hammers are all tested before leaving the manufactory, so that no difficulty is experienced in starting them.

The weight given, and by which the hammer is designated, does not include the pressure of steam upon the piston, but only the weight of the tup and piston. The blow given will vary from the lightest tap to from five to ten times the weight of those parts which would be equal to a pressure of 100 times the same weight. In another issue we will illustrate some of the larger hammers of the same manufacture.

Coal Dust.

Recent scientific investigations by the Prussian Firedamp Commission, in inquiring into the causes of explosions in mines, have developed some very interesting facts. Among other things they find that many explosions attributed to firedamp, or outbursts of gas, are really due to the fine coal dust in the mines. It appears that all kinds of dust are capable of exploding violently when ignited by such means as the electric spark; and second, that the explosion extends much further with coal dust than with firedamp. We are told that every kind of coal dust was tried, not excepting schist even; that the tests were many times repeated, more than two hundred times in all; and that explosion occurred in every case. The German Commissioners found no such limits as fifty yards, and no such mild phenomenon as a simple "tongue of flame." The results they have obtained bring a valuable addition to our stock of knowledge, and enable us to explain many accidents given up as inexplicable. There is no longer need to assume in every case a sudden irruption or "gaseous emanations." The ubiquitous dust might have been the sole agent of destruction, and henceforth these floating particles of carbonaceous matter must be regarded as a foe to be combatted scarcely less potent than the firedamp itself. The discovery is both alarming and re-assuring. It is in a high degree disquieting to call to mind the license allowed in dusty workings in the matters of lighting and shot-firing.

The experiments relative to the inflammability of coal dust were made at the Koenig Mine at Neunkirchen, Sarrebruck, and were devised as nearly as possible in accordance with the conditions prevailing in practice. A gallery or drift driven from the surface was chosen as the place wherein to treat the dust, and means were provided to keep the particles in a state of violent agitation by currents of air. To provoke ignition of the dust, the electric spark was made use of, a means which is far from furnishing that volume of flame the French experimentere found to be necessary to explode coal dust.

Tin Ore in the Black Hills of Dakota.

The following paper was read by William P. Blake, New Haven, before the American Institute of Mining Engineers: The discovery of tin ore in the Black Hills of Dakota dates from June, 1883, and short preliminary notices were published in September of that year. The discovery-point is known as the Etta Mine, in the central portion of the Hills, about six miles east of Harney Peak, and twenty from Rapid City. The Etta was located for mica. It is a granitic mass, rising in the midst of fine-grained micaceous and arenaceous slates, which resemble the Coos group of the White Mountain formations of New Hampshire. Some portions of these slates are highly garnetiferous; other portions contain staurotide; and in some places there is a large development of sandstones of regular stratification, in thick beds, which form prominent ridges. These sandstones are compact and solid, and possess a bluish-gray color, due to protoxide of iron. They are in the condition of quartzites, and they indicate shallow seas on the borders of some continental or extensive shores in that remote period of the world's history.

There is a singular absence of limestone strata and of magnesian rocks in these old formations. Hornblendic slates and syenitic rocks are also rare. Granite, in the form of bosses, and (nearer to the Harney Peak range) in long dikes is common. But at the Etta, and in its vicinity, the granitic masses are columnar, rather than tabular, in form. The Etta outcrop is nearly circular, in horizontal section, measuring about 200 feet in its longest diameter, and 100 to 150 feet in its transverse diameter across the outcrop.

The line of demarcation between this granite mass and the slates is sharp and distinct; and where the contact is opened to view by the lower tunnel, there is a clay selvage making a distinct wall, as in regular veins. This mass, like most of the similarly-formed granitic masses of the region, is characterized by extremely coarse, massive crystallization of the constituent minerals. Slabs of pure feldspar, from twelve to twenty inches in length may be frequently seen, and masses of white quartz, several feet thick and nearly pure, are abundant.

Structure of the Etta Vein.

The outcrop and the whole columnar mass have a rudely concentric structure; the outer portions, next to the country rock, being characterized by a band or belt of dark-colored mica, alternating in places with muscovite in large plates. This is succeeded by massive quartz, with irregular bunches of massive albite and of orthoclase (feldspar, together with enormous crystals of spodumene and irregular bunches of a dense aggregation of small crystals of mica and albite, forming a kind of greisen-rock, an albitic greisen, in which cassiterite is abundantly disseminated in small grains and partly-formed crystals.

Percentage of Black Tin in the Ore.

The mineralization is remarkably even. The masses of greisen are rarely without the black grains of cassiterite sprinkled through the mass. The percentage of black tin is not yet ascertained by working in a mill in the large way; but average samples show that it is about 2½ per cent. Hand-samples of selected rock will yield as high as 6 per cent. The result originally obtained by sampling the outcrops was 3 per cent. A sample lot of two tons of greisen-rock ore sent to New York, and there worked, yielded between 3 and 4 per cent. of concentrate—black tin of high grade—some of which, smelted by Mr. Riotte, at the New York Metallurgical Works, gave a number of 25-pound bars of excellent tin.

These percentages are, of course, independent of the massive cassiterite, of which some hundredweights have been found outside the greisen-rock. This occurrence is exceptional; but more may, at any time, be brought to light by the excavations.

The percentage of black tin in the ore compares favorably with that found in the ore of other tin regions.

The general average percentage of black tin of six large mines upon the great flat lode of Redruth, Cornwall, in 1876, was 2 22-100; and less than this has been worked with profit in some places.

Minerals Associated With the Tin Ore.

The mineralogical association of the tinores at the Etta and other places in the Black Hills, appears to be very similar to that observed in other tin regions. As a general rule, mica is the most common associate. This is the mineral with which the cassiterite is most directly and closely connected. Albite may be mentioned as next in intimate relationship, while in some of the veins—notably in the Hill City district—quartz is the pervading gangue of veinstone. At the Etta, also, spodumene, rich in lithia, is a close associate, and occassionally cassiterite is found in the midst of the massive crystals. This association of spodumene with tin stone is common in several of the granite masses in Maine, and was brought to my attention by Mrs. Ellen Richards, or the Massachusetts Institute of Technology (one of our members). I am not aware that this paragenesis has been observed abroad.

The absence of topaz, so far as yet known, is a little peculiar. Beryl, which is common in the Black Hills in other granitic masses, has not yet been recognized as present with the tin-ore. The same may be said of tourmaline, which is very abundant in some of the granitic dikes, and especially in the great cliffs of Harney Peak and its vicinity, yet does not occur to any noticeable degree in the Etta; and where it does occur, so far as yet ascertained, tin is absent. An exception may be noted in the Boh Ingersoll dike, where indicolite, a beautiful blue tourmaline, is abundantly entangled with muscovite mica in large plates; but it is not in direct association with the tin ore, which is enclosed in albite. This species, tourmaline, is generally enumerated as one of the associates of tin stone; but my observations in the Black Hills lead to the belief that it is not so, thus confirming the observations of Lodin upon the tin-bearing veins of Villeder and Morbihan, France, described in his paper recently presented to the Geological Society of France, which notes the fact that tourmaline, though abundant in the region, is not found in close relationship with the cassiterite.

In addition to the minerals already mentioned as found with the tin stone at the Etta mine, the following should be mentioned:

Apatite, tripbylins, beterosite, leucopyrits (or rather a stanniferous arsenical iron, requiring furtber examination), tantalite, or columbite, a small quantity of vitreous copper (the only sulphide seen), and a few secondary oxidized species, due to ths surface-decomposition of the arsenical compound and the copper sulphide.

The associates of cassiterite in New South Wales, according to Professor Liversidge, are quartz, mica, otboclase feldspar, fluorspar, molybdenite, garnet, beryl and topaz; also, mispickel and tourmaline. Wolfram does not occur in the same veins with the tin, but is in other veins almost in juxtaposition. This association is not unlike that found in Dakota, with the exception of fluorspar, topaz and molybdenite, which have not yet been recognized. Wolfram has not yet been found with the tin ore, though it occurs in the region.

Extent of the Tin Region.

There are now three well-defined districts of tin-bearing lodes in the Dakota portion of the Black Hills:

1. On the east side of the Harney range, at the Etta, Ingersoll, Monarch, Peerless and other claims.

2. Near the summit, at Bismarck's rancho, where cassiterite occurs in several narrow veins of quartz.

3. At Hill City, on the western side of the Harney range, where there are both granitic veins and quartz veins bearing tin ore.

To these we may add mention of a tin district in the Wyoming portion of the Black Hills, about 20 miles west of Deadwood, where a considerable amount of stream tin has been washed out of the bed of Sand creek, and the discovery of the ore in place in granitic veins is reported.

In ths Hill City district, the cassiterite is generally in crystalline hunches or masses in the midst of quartz, together with a bordering mass of mica in close compact crystals, frequently forming sheets of mica crystals in the midst of the quartz, parallel with the walls. It is rare that any other minerals are found in these veins. In the granitic veins the grains of cassiterite are smaller, blacker and more crystalline than in the quartz veins.

Contemporaneous Origin of the Ore and Rock.

In the numerous tin-veins and tin ore-bearing granitic dikes of the Black Hills tin region, the phenomena of occurrence and association indicate that of all the minerals of the dikes—the quartz, feldspar, spodumene, mica, beryl, columbite, tantalite, phosphates and other associates of the cassiterite, were contemporaneous in origin. The tin-stone is apparently as much a part of the mass as the mica or quartz. It was, to all appearance, present when the whole mass assumed its crystallization. All the constituents of the dike appear to have crystallized from a semi-fluid or pasty magma, in which the elements were free to arrange themselves from one side of the dike to the other and to crystallize out slowly. This is indicated in several ways, but strikingly by the gigantic crystals of spodumene stretching across the mass at the Etta, in straight lines, for 20 to 40 feet, in the midst of quartz, feldspar and tin ore.

The aggregation is totally unlike that seen in narrow fissures, filled gradually by the flow of solutions depositing layer after layer on each side, until the fissures were gradually filled up. In the granitic dike, or intrusion, or segregation, of the Etta, and other places where tin occurs, the rude concentric or parallel structure seems rather to be due entirely to the different conditions of pressure or temperature next to the walls while the fissure was full of the unsolidified constituents of the lode or the dike. There are no signs of infiltration or of alteration or of replacement, in a secondary way, of the minerals by the tin stone, which, in all cases, would appear to have been one of the original constituents of the granite, as much so as any of the other earthy minerals. So far, also, as yet seen, there is nothing to sustain the views expressed by Dr. Le Neve Foster, that the tin-stone of Cornwall, at least, is the result of the infiltration of solutions depositing it in the granite adjacent to fissures, and partly replacing and altering the minerals of the granite.

It is also difficult to find in the conditions observed in Dakota a full confirmation of the theory of Daubree, which supposes that cassiterite results from the decomposition of volatile fluorides or chlorides of tin. The usual association of cassiterite with minerals of which flonring is a constituent, is considered an evidence of this. But in Dakota such conditions are not prominent.

American Engines for Egypt.

In a recent number of ths PRESS we referred to the feeling which had been created in England over the contract by the Government with an American firm of pump manufacturers, to supply the pumping engines for the supply of water in the pipe line system to the British troops about to traverse the desert in Egypt. In this country the contract gave great satisfaction, inasmuch as coming from such a source it was particularly a tribute to American skill and scientific advancement. From a member of the firm of Henry R. Worthington (who have the contract) the New York *Commercial Bulletin* learned that the necessities of such a perilous journey had been considered by them as far back as last fall, and proposals and estimates had been submitted months ago by their London house to the British Government. Expediency alone had not induced the English Government to award them the contract; the special facilities they had for producing precisely the class of work required were perhaps quite as important factors to he considered. About 20 engines would have to be sent. One was already on the way, three or four more would leave in a week or so, and the whole contract be completed within three weeks. The engines are from 150 to 200 horse-power. Skilled hands were at work night and day. The journey for troops from Cairo to Berber by way of the Nile is about 1,200 miles. From Suakim to Berber in a direct line across the desert, the distance is not more than 260 miles. But the absence of water makes the journey an impossibility for large bodies of troops. Even a railroad would be difficult to maintain, owing to the need of large quantities of water for the engines and for the guards along the road. Water must be had at any cost. The plan now adopted is to run two four-inch pipes over the whole distance. Every 30 miles or so will be a tank and two engines, with a capacity for forcing water along at a pressure of 2,000 pounds to the square inch. Two pumps are used in case of accident to one. In forcing oil from the oil fields to the sea-board they have to cross mountains, and the work is tremendous compared to running water along a level surface. The pumping engines to be used are about 15 feet long, and require from 150 to 200 horse-power of steam. The pumps will deliver water at the end of the route at the rate of about 150 gallons a minute.

Timbering of Mines.

A writer in the *Colliery Guardian* gives some of the rules of the colliery with which he is connected, and which have worked well in preventing accidents from imperfect timbering. The two special rules are as follows:

"1. It is the duty of each hewer to attend to the safe timbering of the place in which he works; for which purpose he will at all times be supplied with a sufficient quantity of timber; and if from any cause he is unable to make such working-place secure, he is to discontinue working and give immediate notice to the overman.

"2. In 'benching' or 'holing' the coal the hewers are to work under the direction of the overman, and set a sufficent number of sprags to keep the coal up, until the benching or holing is completed and the coal let down with safety.

"I am pleased to say that under this system of working we have not had a fatal accident by a fall of coal or roof in a working place for twenty-four years, though we have raised about 2,750,000 tons of coal, and this with a roof—on one seam in particular—which the late Mr. Brough, inspector of mines, characterised as one of the worst he had ever seen. The only fatal accident from a fall of roof during the period referred to was in a main road, where a portion of the roof, loosened by shot-firing, fell and caused a man's death. This system of timbering prevails generally throughout this district, with fairly equal results."

INDIANS AND MINES.—The Shasta *Democrat* says: That the noble red man is not slow in "catching onto" the little games and sharp tricks of his more civilized white brother was illustrated a few days ago on Squaw creek. An Indian brought one of the miners of that region a magnificent specimen of silver-lead ore assaying $400 per ton, and told the miner that he had discovered a ledge of the same kind of material 15 feet in width, and that for a small consideration he would guide him to the locality of the find. The miner didn't bite, but instituted inquiries on his own hook, which resulted in the discovery that the cunning descendant of the first families of the Sierras had found the specimen at Delta in a box-car formerly used for transporting Arizona ores to San Francisco. Who says the Indian ain't improving and advancing in civilization?

Assaying.

Determination of Chrome Ores and Minerals.

Chromic iron is valued for the percentage of the sesquioxide of chromium it contains. The assay is simple. Chromic iron is, however, extremely difficult to wholly decompose, which must be effected before a perfect assay or analysis can be made.

The following method is given by Fresenius: The ore must first be extremely finely divided by triturating in small portions in an agate mortar, or in a large way by bolting. For the assay, fuse eight parts, by weight, of borax in a platinum crucible; add to the mass while in fusion one part of the pulverized ore, and keep the crucible for half an hour at a bright-red heat; add dry carbonate of soda as long as it causes effervescence. Then gradually, and with frequent stirring with a plantinum wire, add three parts of a mixture of equal parts of nitrate of potash and carbonate of soda, and keep the mass for a few minutes in fusion. When cold, dissolve in distilled water with heat, and filter. The residue which remains on the filter must wholly dissolve in hydrochloric acid, or the decomposition has not been successful, and the operation must be repeated with more care. The chromic acid, in the yellow aqueous solution, is thrown down by a solution of nitrate of mercury and the precipitated chromate of mercury, well washed and dried. When calcined, the volatile mercury is driven off, leaving pure sesquioxide of chromium, which is weighed and the percentags calculated. Sometimes the solution from the crucible is precipitated by acetate of lead, and the oxide of chromium calculated from the weight of the chromate of lead. It will be necessary in that case to nearly neutralize the solution with acetic acid before adding the acetate of lead. The calculation is made as follows: Suppose one gram of the ore was used in making the assay, and the sesquioxide of chromium obtained by the first method was 0.436. This multiplied by 100 would give the percentage = 43.6. In the latter case it would be as follows, using the same figures: One part of neutral chromate of lead contains .3096 parts of chromic acid, and 43.6 of chromate of lead obtained would equal $43.6 \times .3096 = 13.498$, the percentags of chromic acid in the ore. To obtain the sesquioxide equivalent calculate as follows: One part of chromic acid contains .5200 of chromium, and one part of the sesquioxide .6842 parts of chromium, $.6842 \cdot 5200 = 1.315+$. Then one part of chromium, obtained by the above calculation, would be equivalent to 1.3154 parts of the sesquioxide.

To simply test for the presence of chromium in a mineral, the following will afford quick and reliable results: The ore is finely powdered in an agate mortar. A bead of borax is then formed in a loop, on the end of a platinum wire, by heating the loop by means of a blowpipe flame. While still red-hot, the end of the wire is touched to some powdered horax and again heated. This is repeated until a transparent bead of borax glass incases the loop. When cold, the bead should be colorless, if the wire was clean and the borax pure. The bead is then to be slightly wetted and touched to the powdered ore. Only a small portion should be allowed to attach itself to the head. The blowpips flame is again applied until the substance is perfectly fused with the borax. While hot, the bead will generally be of a faint yellowish color, but when cold, if chromium is present, it will become emerald green. If the bead is touched while hot with a piece of tin-foil, the reaction will be intensified. It sometimes happens that too much of the powder attaches itself to the bead and an opaque glass results. In this case the bead may be broken by a blow from a small hammer, and the powder placed on a piece of white paper, when the characteristic green color will be seen. This color must not be confounded with the 'bottle green, which results from iron treated in the same manner.

To make this assay still more certain, the California State Mineralogist, Mr. Hanks, recommends proceeding as follows: Saturate the horax bead as directed, using more of the mineral without regard to the color—dip the bead into pulverized nitrate of potash, and heat again strongly in the blowpipe flame. The bead will now be yellow and opaque. Repeat the operation as long as the flux can be made to remain on the platinum loop. Let it cool and detach by a blow from a small hammer. Grind the powder in an agate mortar with water until a solution is formed. Add a drop or two of acetate of lead, using a glass rod for this purpose. A yellow opaque precipitate will appear. Now transfer the liquid and precipitate to a small white paper filter, and dry. It will be easy now to recognize, under a microscope, chrome yellow on the paper. This is a very conclusive test, and can easily be made in twenty minutes.

CONSIDERABLE excitement prevails among the people of Cherokee and vicinity, so we are informed, in relation to the location of quartz mines and wood ranches. A number of what are supposed to be rich quartz lodes have been located between Cherokee and Columbia Hill, on the east side of Shady creek. Good prospects have been obtained from some of the locations, and the locators are jubilant.—*Nevada Transcript.*

TENTS and small buildings will be probibited on the beach at Santa Cruz this summer.

Recording Mining Claims.

The following is the new Nevada law to pro de for the better preservation nf the mining cords of the State:

Sec. 1. It shall be the duty of each and ery mining recorder nf the several mining stricts of the State to require all persons lo ting and recording a mining claim to make a uplicate copy of each and every mining notice, hich copy the said mining recorder shall eare lly compare with the original and mark "Du icate" on its face or margin, and he shall im ediately deposit with nr transmit the same to e County Recnrders nf the respective counties which said mining district may be located.

Sec. 2. The said district mining recorders, the time of comparing said duplicate notices ith the original, shall collect from the loca rs of said mining claims the sum of one dollar r each and every notice compared, which sum shall transmit, together with the duplicate tices, to the County Recorders of the respec ve counties in which said mining claims shall located.

Sec. 3. Whenever, owing to the distance of the mining district from the county seat, it comes inconvenient for the district mining re order to personally deposit the duplicate copy ith the County Recorder, then in that case he ay forward the same by mail or express, or ch other manner as will insure safe transit d delivery to the County Recorder.

Sec. 4. The County Recorders of the several unties shall receive for their services for re rding each of said duplicate notices, the said m of one dollar, mentioned in section two of is Act.

Sec. 5. The county record of the duplicate pies in the office of the County Recorder, as erein provided, shall be received in evidence, d have the same force and effect in all courts the State as the original mining district cords.

Sec. 6. Any person neglecting or refusing to mply with the provision of the Act, shall be eemed guilty of a misdemeanor, and, upon nviction, thereof, shall he punished by a fine ot exceeding five hundred dollars, or by im risonment in the county jail not exceeding six onths, or by such fine and imprisonment.

Sec. 7. All acts and parts of Acts in con ict with this Act, are hereby repealed.

San Jacinto Tin Mine.

In the United States Circuit Court, Judge awyer has rendered a decision in the case of is United States vs. The San Jacinto Tin Com any. The ownership of a tin mine in San eruardino county was the occasion of this case nd of other litigation, the beginning of which ates back 32 years. The name of the United tates was used by Col. S. H. Baker, he being he plaintiff. The suit was to set aside the pat nt under which the tin mine is held by the San acinto Tin Company. Judge Sawyer dismissed he hill, leaving the victory with the tin com any. Mr. Hilborn intimated that an appeal ould be taken. Both parties at interest an ounced an intention to confer with the new nited States Attorney-General.

Judge Sawyer's decision was very long, and ver an hour was consumed in the reading. Al eged fraud on the part of officials con ected many years ago with the Land Office, he aid, was the basis of the suit. It has been de ided that the Act by which the Mexican grant as fixed was final and conclusive unless there as fraud. Messrs. Edward Conway, George . Thompson, T. C. Whiting and Joseph S. Wilson were alleged to have held an interest in he San Jacinto ranch at the time the location as made, and it was alleged that all bad fraudu ently conspired to locate the land to get posses ion of a valuable tin mine. If the charges were ot proven the case must fail. The character f the officials against whom the charges were ade was well known, and they denied di ectly that such charges were true. Conway urchased the grant, and that is on record. The testimony fails to show any act of fraud on he part of the persons named. Fraud not be ng established, every equitable ground upon hich the suit rests fails. The Court cannot eview any errors of location. It would be in quitable at this late day to vacate the patent. The present owners ought not to he disturbed, except upon the most cogent reasons. There hould he some time in a generation when Mexican land titles should be settled. It is ime that acrimonious legislation of this peculiar kind should cease. He hoped that in the future he name of the United States, for the purpose f private litigation, in such cases, would be sparingly used. The bill was dismissed.

THE NEWFOUNDLAND DISTRICT.—William Ames has returned from the Newfoundland district, bringing with him numerous samples of ore found in the new district. Some of the specimens assay 43 ounces silver, with a good percentage of lead. Another lot went $40 in copper and $39 in silver to the ton, with a streak of gold. Messrs. Browne and Brooks, of this city, who are heavily interested in some property there, propose to erect a mill and fur nace this year for the profitable handling of ores. The Newfoundland district is an island in the desert, the island being 25 miles long and about five wide. A boom is imminent for the district. Terrace, on the Central Pacific is the nearest railroad station, 20 miles away.—*Salt Lake Tribune.*

Useful Information.

SILVER SURFACED IRON.—A successful meth nd nf giving a silver surface to iron has for some time been employed by a Vienna manufacturer. The plan is to first cover the iron with mercury, and then silver by the galvanic process. By heating to 300° C., the mercury evaporates and the silver layer is fixed. Iron ware is first heated with diluted hydrochloric acid, and then dipped in a solution of nitrats of mercury, being at the same time in communication with the zinc pole of an electric battery—a piece of gas carbon or platinum being used as an anode for the other pole. The metal is soon covered with a layer of quicksilver, and is then taken out and well washed and silvered in a silver solution. To save silver, the ware can be first covered with a layer of tin, ono part of cream of tartar is dissolved in eight parts of boiling water, and one or more tin anodes are joined with the carbon pole nf a Bunsen element. The zinc pole communicates with a well-cleaned piece of copper, and the battery is made to act till enough tin has been deposited on the copper, this being then taken out and the iron ware put in its place. The ware thus covered with tin chemically pure, and silvered, is said to bo much less costly than any other silvered metals.

MANUFACTURE OF LIQUID GUNPOWDER.—One of the greatest difficultics encountered in the manufacture of gunpowder is the intimate admixture of the constituent parts, the combustion of which produces the explosion. Mr. Nordenfeldt has advanced a very ingenious and rather novel idea, for which he has applied for letters patent. He proposes, instead of grinding together the primary substances—sulphur, charcoal and saltpeter—in their solid state, to employ the following process instead: Sulphur in the desired ratio is put in solution as sulphato of carbon; this is mixed with carbonaceous matter, which in this case is not charcoal, but cotton, or cellulose fiber, ground to an impalpable powder. Finally, a saturated solution of saltpeter is added to this mixture in the required proportion. There remains now nothing to be done except to evaporate under disturbed crystallization—or *in vacuo*—to obtain a powder the elements of which, according to the inventor, are thoroughly mixed and therefore in condition to furnish the maximum useful effect. This is almost strictly a liquid powder which is thus obtained.

UNBURNT BRICK.—Much as many dispute the fact, it is nevertheless true that unburnt brick forms a much drier wall than ordinary burnt brick, inasmuch as they are not so absorbent of wet or damp. To make these, any ordinary clay will answer. If dry when obtained, it must first be moistened and thoroughly worked by the feet of cattle or pounded by the hand. Cut some straw into pieces about six inches in length. After being duly mixed with the straw, the clay is ready to be made into bricks. A mould of any size may be made. This mold should have a bottom, but not air tight, in order to prevent the brick from stickieg in the mud. The clay is put into this mold, and the brick formed much in the same way as ordinary brick. Should the clay be very tenacious, a little sand sprinkled in the mold will enable the brick to leave it freely. The bricks are placed on level ground to dry, turnieg them on their edges on the second day; thereafter left in piles, protected from the rain for ten or twelve days.

WHY CHINA IS SO NAMED.—Upwards of 1100 years before Christ, the Chinese were a people ruled by a dynasty of kings, of whom, like the Pharaohs of old, there is no clear history and not until the "Chow" dynasty, B. C., 1125, is there any history of the main Chinese State. The Chinese take their history back to the time of Noah. This very ancient empire has borne in its time many names, for it was the custom when a new dynasty ascended the throne to give another name to the empire, as Hai-que, Chum que, Han-que, etc., according to the name of the ruling monarch. The true name is said to be Chumque, "the center kingdom of the world." This term was by usage corrupted to Chin que, and from this word the Portuguese gave it the name of China. China proper consists of eighteen provinces, containing 250,000,000 people.

A NEW PAINT.—A new paint, consisting of a mixture of zinc white with zinc chloride, has been for some time in successful use at Brest for painting wood and metals; it becomes very hard, and can he washed or brushed without injury. It should not be applied, however, in rainy or frosty weather, as it then becomes mealy, and scales off easily. Chloride of zinc is not the only salt which possesses the power of forming a mastic by its mixture with zinc white, for Sorel long ago showed that the proto chlorides of iron, manganese, nickel and cohalt were good bases for mastic. The dockyard authorities at Brest have extended their experiments, and have shown that the sulphate and nitrate of zinc, the nitrate and chloride of iron, and the sulphate and nitrate of manganese, all form good mastics with zinc white.

BONES AND HORNS FOR ENGLAND.—The United States furnishes Great Britain with about 109,000 dollars worth of bones, horns and hoofs every year, a portion of which is returned in scales for the American cutlers, and the remainder from the finished cutlery from Sheffield. The shank bones of oxen are almost exclusively used for this purpose, 2,000,000 being required annually by the cutlery trade, and the best of these form a fair imitation of ivory.

SOAPSTONE FINISH FOR WALLS.—The latest invention for covering walls and ceilings is called "Soapstone Finish," and is mainly composed of pulverized steatite. It takes a high polish, it is pearl-gray in tint, presents the best possible surface for painting, either in oil nr water-color, and it will neither crack nor chip. It is claimed to he a non-conductor and non-absorbent, and can be washed without injury. Nails can be driven into it without damage. When subject to heat, moisture and chemical fumes, it is said to give no smell; it also does not turn yellow with age. It is recommended for hospitals, factories, cellars, markets, closets, pantries and kitchens, and is pleasanter to the eye than ordinary whitewash or cheap paper.

A SOAP BUBBLE RECIPE.—Dissolve one part, by weight, of borax soap, cut into thin slices, in forty parts of water (distilled water is to be preferred) and filter. 2d. Mix two parts, by measure, of pure glycerine with one part of the filtered solution, at the temperature of 66° F., and, after shaking them together violently, leave them to rest for several days. A clear liquid will settle, with a turbid one above. The former is to be drawn from beneath the latter with a siphon, taking the utmost care not to mix the two. A bubble blown with this liquid will last several hours in the open air. Instead of draining off the clear liquid with the siphon, the mixed liquid, after standing 24 hours, may he filtered and used for the bubble.

THE LIQUID HAND GRENADES for extinguishing fires consists of sodium chloride, ammonia chloride and hydrochloric acid dissolved in water, with the addition of potassium carbonate and subsequently sodium bicarbonate, and last of all a little free crystallized tartaric acid is added. The object of such a mixture is the generation of carbonic acid at the time of the fire, so that if it can be arranged to have a solution of some carbonates, sodium or potassium, so placed that in the event of fire a free acid of some character can be brought into contact with the liquid, thereby generating the carbonic acid gas, the purpose will be accomplished.

A NEW MACHINE IN TANNING.—An apparatus for tanning hides has been patented by Mr. Emile de Solminihac, of Lorient, France. A skeleton drum or cylinder is provided, upon the circumference of which the hides or skins are held or stretched, secured by clips, centrifugal action being utilized for causing the penetration of the tanning material through the pores of the hide or skin.

Good Health.

Good Common Sense.

EDITORS PRESS:—Our attention has been called to an article in your issue of the 21st, by Carrie S. Walters, entitled, "Good Common Sense." We agree with much the writer has said, and seeing so plainly that she unfortunately does not understand the character or scope of the life work we have before us, we not only send her sample copies of *Joyful News*, published to represent our cause of purity, but would, with your consent, occupy a little space to correct the misunderstanding that may be in the mind of other of your readers. Extremes, when they react, are apt to go nearly as far the other way; such seems to be the case with "C. S. W." after her unfortunate experience with vegetarianism. We gave the ultra-vegetarianism as thorough a trial as she, and are with her in voting it a failure; but we doubt if she has come so near to first principles as we have. Wish she had given particulars as to her present condition. We would like to compare notes. She says "eat whatever hest] nourishes and agrees with one, guarding jealously every means by which digestion and assimilation may be best promoted." This is splendid until, like we, you become so strong in those powers that nothing fails to digest, and you cease to know you have internal organs. We also became enfeebled living on bread and fruit until in the condition she describes; but the Edenic life has made a new man worth at 51, two such men as we ever was before. Whilst she "can even now digest very little fruit," we can eat and digest at one meal ½ lb grania, ½ lb walnuts and 2 lbs fruit. How much more we cannot say; but we tried the above as an experiment and the digestion was complete, whilst three years ago a half dozen walnuts would report trouble inside. Who would not try the Edenic. Any patent medicine giving such results would make the owner a millionaire. But a life of christian purity is too cheap and free to be accepted. We do not believe in "C. S. W.'s" idea of a return to state of nature. We believe in science, and if better results can he had by grafting pear on quince we have no more use for the pear roots. "Get the very best kind of food and eat it under the best conditions" is so good we repeat it. But my dear friend are you doing that. If you have anything that will do more for humanity as proved by such evidence as we have to offer, will you not come forward and help stay the tide of corruption and bring people to a life of purity and love. We are ready to be learners. Specimen copies of *Joyful News* sent to all who apply, whilst we have them to spare. Yours truly for truth,

ISAAC B. RUMFORD.

San Francisco, 1209½, Bush Street.

A Dietetic Investigating Society.

EDITORS PRESS:—One thing very much needed in this age of the world is a Dietetic investigating society, composed of scientific minds, to make a study of the influence of different methods nf living, and also the effect of the continued use of different articles of food in both the cooked and uncooked state. Said society should have committees appointed to take up different branches of the subject, gather in evidence pro and con and report to the society. Members and others should be induced to experiment, and note carefully the results. Judging from my own experience, since being connected with this subject, and from evidence received every day there is a broad field here open, worthy the best effort of careful thinkers. We have many minds devoted to curing people; we should have some who would make a scientific effort to find out how to keep well. If any persons wish help to form such a society, and will call upon or send their address to me, I will arrange a place and notify them, so we can all get together and consider the subject. Yours truly,

ISAAC B. RUMFORD.

San Francisco, 1209½ Bush St.

HEALING PROPERTIES OF WATER.—There is no remedy of such general application and none so easily attainable as water, and yet nine persons in ten will pass it by in an emergency to seek for something of less efficacy. There are but few cases of illness where water should not occupy the highest place as a remedial agent. A strip of flannel or a napkin folded lengthwise and wrung out of hot water and applied around the neck of a child that has the croup will usually bring relief in ten minutes. A towel folded several times and quickly wrung out of hot water and applied over the seat of the pain in toothache or neuralgia will generally afford prompt relief. This treatment in colic works like magic. We have known cases that have resisted other treatment for hours yield to this in ten minutes. There is nothing that will so promptly cut short a congestion of the lungs, sore throat, or rheumatism, as hot water when applied promptly and thoroughly. Pieces of cotton batting dipped in hot water, and kept applied to all sores and new cuts, bruises and sprains, is the treatment now generally adopted in hospitals. Sprained ankle has been cured in an hour by showering it with hot water, poured from a hight of ten feet. Tepid water acts promptly as an emetic, and hot water taken freely half an hour before bedtime is the best of cathartics in the case of constipation, while it has a most soothing effect on the stomach and howels. This treatment continued for a few months, with proper attention to diet, will alleviate any case of dyspepsia.

PREHISTORIC DENTISTRY.—The *Independent Practitioner* for January contains an article by Dr. J. G. Van Marter of Rome, upon evidences of prehistoric dentistry in Italy. In the museum of Corneto-Tarquinius, a city on the Mediterranean coast, the author found two specimens of ancient dentistry, which the mayor of that city certifies were found upon the first opening of the buried Etruscan tombs. Professor Helbig further assures him that these were virgin tombs, which date back four or five hundred years before the Christian era. In one of the specimens the two superior central incisors are bound by a hand of very soft gold to the teeth on either side. The artificial teeth are well carved, evidently from the tooth of some large animal. One other artificial tooth was held by the same band, but it is lost. Dr. Van Marter has in his own possession a skull in which the disposed of during the year 1,789,021,939 feet first upper molar on the right side is missing, and which shows plain marks of an alveolar abscess, proving conclusively the existence of toothache among the early Etruscans. As the tombs have been only slightly explored, and as only the noted men of Etruria were embalmed, the rest being cremated, it is not strange that these evidences of dentistry have been so long undiscovered.

INOCULATION OF TUBERCLES.—A healthy girl, a cook, broke a glass and ran a splinter into her middle finger. The glass was one used by her employer, who at the time was dying of consumption, in which to expectorate. A nodule of granular matter formed and was removed, and eventually it was found necessary to amputate the finger and remove the swollen glands of the elbow and the arm-pit. All the parts removed showed tubercular degeneration, and contained bacilli. Thus, whether the bacillus is cause, effect, or neither, it is evident that tubercular poison is communicable.

NUMBER OF DENTISTS.—In the United States there are 17,000 dentists, who use a ton of gold and five tons of other metals, and make 4,000,000 artificial teeth annually. Only one American in eighty is found to have perfect teeth, and one-third of the population make more or less use of the artificial product.

YELLOW FEVER VACCINATION.—Emperor Dom Pedro of Brazil has sanctioned a method of vaccination against yellow fever, and 500 persons have been vacciated at the Rio de Janeiro by Dr. Dominges Freire, to whose investigations the idea is due.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA

Amador.

AMONG THE CLAIMS.—Amador *Sentinel*, March 25: The Acme shaft in the Fort Ann district, is being retimbered. The McKinney & Craniss mine, at Middle Bar, is now being worked with favorable indications. Dan McKay has laid down a string of boxes on his claim for the purpose of sluicing off a portion of the ground. Work has been re-commenced on the Marlette and Sargent mine, at Middle Bar. The last working of this mine showed some excellent rock. Morgan & Shugert are now preparing the foundation for their new mill. They have brought a hydraulic into requisition to sluice off the ground. Hadley & Vair have purchased the Golden Gate hoisting machinery and will set it up upon their mine in Fort Ann district. Their shaft is now down 140 feet, with good indications. They are intending soon to erect a ten-stamp mill. The Petty Brothers' mine in Fort Ann district is looking favorable. They are running a tunnel 100 feet for the purpose of draining the surface water. The last run in an arastra paid $22.50 per ton. The ledge, near the surface, is from 10 to 15 inches in width, and at a depth of 25 feet it widens out to two and a half feet.

Del Norte.

FREE GOLD.—Del Norte *Record*, March 27: The board of directors of the Bald Hills quartz mine during the last week paid a visit to their mine and brought home with them about 30 pounds of rich ore from their dump. Most of the ore brought in shows free gold. The owners of the above mine are about to let a contract for sinking about 100 feet in their shaft. From what we can learn this mine is as rich as any in Northern California.

El Dorado.

THE TEXAS HILL MINE.—*Mountain Democrat*, H. S. Morey of the Placerville Foundry, has just turned out a self feeding and dumping water car for the Texas Hill mine, which carries 320 gallons. This mine is again being operated, and a full force of men kept at work.

BOULDER MINE.—Under the superintendence of of Delmont Blair, this property, situated in Coloma township is paying well. The mill has been kept running day and night ever since it was started up, about the first of February.

OLD HICKORY.—Last week we stated that A. E. Ball, of Oakland, was here looking after his mining interests. Since that time he has let a contract to Owen Roberts, Alfred Ball, Thos. Moyle and John Pascoe, to sink 150 ft deeper on the Old Hickery mine, just this side of Kelsey. So far as this mine has been worked, it has prospected well, and the owners have full confidence that when the present contract is completed they will have a good paying property.

Mariposa.

EUREKA.—Mariposa *Gazette*, March 28: The developments now being made at the Eureka mine, at Quartz mountain, Hornitos, is exceeding the most sanguine hopes of the proprietors. The level now being run into the mountain has uncovered a ledge of large dimensions, which can be milled at small expense. The rock is inexhaustible and will go $15 to the ton. This is something of a bonanza, when it is known that four-dollar rock will pay handsomely. The controlling interest in this property is owned by parties in Providence, R. I., they having purchased the same from S. C. Bates of Merced, and Mose Rogers of Hornitos, last fall. The two latter still own several shares in the mine. Mose Rogers is superintendent of the mine.

Nevada.

A NEW MILL.—Nevada *Transcript*, March 28: J. E. Owen, the millwright, leaves to-day for Washington township where he will erect a mill on the Waters mine. The timbers and machinery are all on the ground, and the work will be put through quickly.

MOORE'S FLAT.—The Metropolitan quartz claim is situated near Moore's Flat, between that place and Orleans Flat. It embraces 3,000 ft along the ledge, and is owned by L. F. K. Buck. Two tunnels have been run, one 500 ft in length and the other 326 ft. They show a fine body of pay ore from 3 to 6 ft thick, and 700 ft long. Wherever the ore has been prospected it pays largely in free gold and sulphurets. Two ditches run along about the claim giving all the water and pressure necessary for power. Since the discovery by Mr. Buck, seven other parties have found good claims in the same vicinity, while many others are at work sinking shafts and tunnels. There will be much activity in quartz mining thereabout from this time forth. The principal want at that section just at present, so far as this industry is concerned, is a mill for custom crushing. The prospectors have to bring their sampling lots to this city to be tested, an operation, that is expensive and consumes a good deal of time that could be otherwise employed. If the developments continue to be as favorable as they have been recently, it is quite likely that a mill will be erected there before many months elapse.

QUARTZ MILL WATER WORKS.—*Foothill Tidings*, March 24: Johnston & Body are at work on Wolf creek, just below the bridge on Auburn street, preparing to put in pipe for conveying water to Rogers' quartz mill in Boston Ravine. The pipe will be laid along the bed of the creek and will be about 2,000 ft in length, giving a fall of 4 ft at the mill, which is amply sufficient to run an over-shot wheel. A water tank will be built in the creek below the bridge, with dimensions of about 20 ft long, 4 ft wide and 5 ft deep, which will do for all the water necessary for running the mill. The pipe will be laid as soon as possible.

RECENT QUARTZ DISCOVERY.—Nevada *Transcript*, March 26: Very encouraging reports of a general character come to us regarding valuable discoveries of auriferous quartz recently made in the vicinity of Columbia Hill, this county. We wish some friend living there, and who has the facilities for thoroughly posting himself on the subject, would take the trouble to send the *Transcript* a communication giving the details of the developments that are being made. Such an article would be an encouragement to the prospectors and of material benefit to that part of the county in other ways. It would also be of deep interest to the public generally.

THE CALEDONIA MINE.—The Caledonia is the name of the quartz mine on the Coe Ranch, Little Deer creek, being opened by Messrs. Sutton, Battey & Co. They have cleaned out the old shaft and sunk about 4 ft below the former workings which gives them a total depth of 60 ft with an 18 inch ledge of good looking ore in the bottom. The drain tunnel is within 10 ft of the ledge, but owing to the wetness and softness of the ground the running of it has been temporarily stopped. As soon as the water in there has flowed off the tunnel will be pushed ahead again.

Placer.

SALE OF A GRAVEL MINE.—Auburn *Republican*, March 26: The Succor Flat drift mine, near Iowa Hill, Placer county, was sold a few days since for $100,000 to Adolph Weske, who immediately transferred it to a French Company for $200,000. The mine has been worked a great many years, and at present has the appearance of being far from exhausted. In 1882 there had been taken out of it $262,000. Since that time it has been paying very richly. Those who are conversant with mining matters say that prospects in the vicinity of the Succor Flat, and also about Forest Hill and Damascus have seldom been brighter than at the present time.

THE CHICAGO MINE.—Placer *Argus*, March 26: About three-quarters of a mile from Penryn is situated the Chicago mine which has lately changed hands. The present owners are, we believe, a Chicago company. J. A. Hall, a practical and experienced miner, is in charge. He is now putting in new machinery. The prospects are very encouraging.

Plumas.

GREEN MOUNTAIN.—Greenville *Bulletin*, March 25: This property is in a better condition than it ever was. It is equipped with a fine 60-stamp mill and all the necessary adjuncts to facilitate the working of the mine. Mr. Rodgers, the vigilant Supt., has things so planned that work proceeds with great regularity and economy of time. Work in the face of No. 6 tunnel was resumed a week ago last Monday. On that day a fair prospect was struck in the tunnel, and the ore continues good with advancement. The tunnel now being run is of double width, and the entire thickness of the vein of ore is being extracted for milling purposes. Although the hanging wall is bad, rendering progress slow, the face of the tunnel has been pushed ahead 30 feet since worked was resumed on it. The new stopes, 125 feet back on the face, are looking well. About 85 tons of ore is crushed daily and good returns are obtained. The experience in the Green Mountain mine is a forcible argument in favor of deeper mining in Plumas. It has been clearly demonstrated, both in this mine and in the Plumas Eureka, that the quality of the ore improves in depth. Such would, no doubt, prove to be the case with the Crescent and the Indian valley mines, as well as with many others, which are awaiting an application of capital by men of practical experience and intelligence.

Shasta.

PLACER AND QUARTZ.—Shasta county *Democrat*, March 28: Lowrey & Brincard are finding most encouraging prospects on the Silver Queen. They have a shaft down about 15 ft. Dale & Fife of the Silver King last week commenced hauling ore to the depot and the first carload will be shipped this week. Pay ore was struck in the Pioncer mine last week, and consequently the boys owning interests hold their stock pretty high. Fred Grotefend and his partners are showing considerable high grade silver and gold ore in their claim on Shearer's ground on Salt creek. Vet Hull has put men to work sinking on his claim, the first extension south of the Silver King. We hear that he has struck good ore also. Sanders & Whitlow of the Delta mine on Dog creek are putting in a concentrator to save their rich sulphurets which assay from $1,000 to $2,500 per ton. The new shaft of the McDonald Bros.' mine at Deadwood is now down 34 ft and sinking is progressing rapidly. The hoisting works are in place and are running smoothly. The new 10-stamp mill of the Niagara mine will start up next Monday. Everything is now in readiness with the exception of the concentrators which are now being put in position. Mr. Meyers of the Meyers mine at French Gulch is now getting out the timbers for a 5-stamp steam mill. His mine looks well at all points and it is undoubtedly one of the bonanzas of the district. Pehrson has opened out a body of ore on the Monarch, a cross-vein running through the Silver King belt. The shaft is down about 20 ft and Mr. Pebrson is more than pleased with his prospects. Thursday last Keifer & Tucker struck fair ore on the Monitor at a depth of 18 ft. The vein opened out 2 ft wide at this depth, pitching east. This vein is parallel with the Silver King. They put in pumping machinery and are now running 8-hour shifts. Mr. George Klein of Trinity county was in town Sunday on his way home from a three weeks' visit to San Francisco. While below he sold his mine in Deadwood district to a Mr. Sbattuck of Nevada county for $16,000. Mr. Klein was the first locator of a quartz mine in the Deadwood district. Jack Coonant was in town several days last week. We hear that he has a standing offer of $20,000 cash for his several gold mines on Squaw creek he discovered about two months ago, but refused that snug sum and will not sell for less than $45,000. John Q. Finch and Frank Thompson recently discovered a mineral-bearing vein between Welch's and Stump Ranch. Their discovery looked so encouraging that a few days ago they let a contract to run a 50 ft tunnel on the vein. They know the ore carries free gold, but they think it will develop into a good silver mine. Its course is nearly north and south.

Siskiyou.

PICK AND PAN.—Yreka *Union*, March 28: The Centennial mine, Klamath river, is in operation. A scarcity of water for mining purposes is reported at Oro Fino. This will be a very short season for most of the mines, but the yield of gold will exceed that of last season. Patrick Cronan has taken up 20 acres of mining ground on the north fork of Salmon. It will be known as the Cœsus claim. A Kanacka miner picked up a twelve-dollar nugget at the mouth of Spring gulch, a half mile above Yreka, one day last week. Mr. J. O. Welch, is working his hydraulic claim on French creek day and night. The Fort Jones Co., on the Klamath river, will soon commence operations with a large crew, starting in the rich channel which payed so well last year at the close of the season. Mr. J. F. Boyle, of San Francisco, has bonded the Schroder mine, on the divide between Humbug and Deadwood for $50,000. This is the mine from which $10,000 was panned from decomposed quartz during the winter months. The mine is bonded for 90 days. R. H. Campbell, with his large force of men, is piping away night and day in his claim in Quartz valley. Owing to the scarcity of water bis run will be shorter than that made last season, but the ground being richer it is expected that the yield will equal, if not exceed, the amount taken out last year. E. A. Deming by F. W. Gent has located the entire bed of Salmon river. Also the right of way through the ridge from Merrill's bar on Klamath river to Salmon river, 300 feet in width for tunneling and mining purposes. Mr. A. H. Denny is pumping out the Fortune drifting claim at Callahan, and mining will commence in a week or ten days. The Fortune is classed with the richest mines on the south fork of Scott river, and is equipped with the best hoisting and pumping machinery in the county. Mr. Denny is a man of means and well versed in mining matters. Mr. A. M. Johnson of Etna is erecting a boarding house at his quartz mine, near Oro Fino, to accomodate his employees. He says he has a better ledge than ever, and will work a full force of men during the entire season. Thousands of dollars have been taken from the mine, and it looks as though it never would run out. The army of ditch builders employed by Messrs. George Smith, R. H. Campbell and George C. Spooner in constructing the four mile ditch from Little North Fork of Salmon to their Summerville hydraulic mine, are making remarkably good headway. The completetion of this mammoth canal will insure long seasons for one of the best mines in the county. Mr. Henry Budelman of Etna has been appointed superintendent of the Black Bear mine, and is now in charge of the works. Lieutenant-Governor Daggett is expected to arrive every day, and work will be commenced as soon as he arrives. The resumption of work at the Black Bear will open another good market for Scott valley products, which in connection with the large shipments to New River will bring thousands of dollars which otherwise would never find its way to this county. The Hip Wah Hong Company numbering 18 Chinamen, have leased water from the Big Ditch Co., and commenced active mining operations on Yreka Flats, a short distance above town. The ground was worked in early days, but will pay to work again. Six years ago, when worked with giants the claim yielded from five to ten dollars to the man. The mine was only deserted when the new ditch was constructed on the east side of town and the old one abandoned. The Chinamen have great faith in the claim or they would never have refused wages to mine on the Klamath to work it. The Schroeder mine, on Deadwood, which was recently bonded by J. F. Boyle of San Francisco, furnished a ten pound nugget of nearly pure gold last week. When freed of quartz it netted $700.

Trinity.

DEADWOOD LETTER.—Trinity *Journal*, March 28: A long and interesting communication form our Deadwood corresponden', "Trinity," was not received until Thursday evening, and the little space remaining to be filled at that time compels us to condense as follows: Deadwood flourishes. Brown Bear is extracting good milling ore in large quantities. The mill is being repaired; will start up in a week. McDonald & Co. have their hoisting works in operation. Ramm & Kane are taking out splendid ore; Gibson & Blagrave, ditto. J. F. Dotiffe's find is immense. Gibson & Leavitt have a small, rich vein—a late discovery. On Shooter gulch (Eastman's) Hurlbut, Newman & Bearden are taking out rock held together with gold; Hamilton & Gifford have good prospects from a three-foot ledge; Hickey has from six to twelve inches of pay ore. Jas. Fisher & R. Killins are running the Blakemore arastras. "Curt." Blakemore has bought this property.

TRAVEL TO NEW RIVER.—The spring rush to the New River mines has commenced and will increase as the certainty of good weather becomes assured with the advance of spring. On our return trip last week we met 15 men on the road to the mines. All were afoot, some packing their blankets on their backs while others had pack animals. The night before our return four men arrived by saddletrain from North Fork in charge of Johnny Adams. In conversation with a number of gentlemen who reached the mines *via* Eureka, several assured us that they would have come by the Weaverville route had the through trail been completed this way. It is three days hard ride from Eureka to the mines, while from Weaverville they can be easily reached in a day and a half. Many who went there by Eureka simply to see the mines will return this way.

VERMONT MINE.—"A Subscriber" sends us the following from Deadwood: "I see mention in a late number of the *Journal* that the Davidson Cannonball mill was idle for lack of rock. That is a mistake. The mill has no way of saving the sulphurets, which is one reason why it is idle. Another is that the parties in charge of the mill cannot get the privilege of grinding custom rock. As for the Vermont mine, there is any quantity of good milling quartz in sight."

HUMBOLDT WAGON ROAD.—When in at the New River mines we had the pleasure of meeting Messrs. J. H. Crossman and N. Wescoatt, who are there for the purpose of surveying and reporting on its values to the proposed wagon road investors. A lithograph map of the district, will be publishcd, together with a full report of its present condition and future prospects. About three weeks more will be required to complete this work. The preliminary survey of the proposed wagon road will be followed on their return out to Eureka and the terminal line in Humboldt county determined. While the whole length of the road is unknown as yet, it is estimated by Mr. Crossman that there will be from 45 to 50 miles of its length in Trinity county.

RICH COPPER.—A vein of copper ore has been found by N. Lorenz and others on Trinity river just below the McGillivary ranch and near the schoolhouse. The deposit is loose and about six feet in width and it is thought will lead to a solid ledge. Several pounds brought to town by C. E. Goodyear are full of native copper covered with oxide of copper, and the lot is estimated as containing from 75 to 90 per cent of that metal. What its value may be, if anytbing, is not known here, as no attention has been paid to anything worth less than gold.

NEW RIVER MINES.—Trinity *Journal*, March 28: New River District is yet young and while from 150 to 200 locations have already been made and the number is being added to daily, there are comparatively few mines that have been developed to any extent, but each of these has proved valuable. The district is located on Slide Creek, a tributary of New River, and the locations extend over a section of five or more miles, including Battle and Eagle Creeks. The country is covered with float, much of which is very rich in free gold. As an instance of the latter, the Mountain Boomer location may be referred to. Although no permanent ledge has been found, something more than $9,000 has been realized in grinding float and detached quartz in an arastra. While at the Boomer we picked up several pieces of float in different places showing free gold, and a hand-full of earth which we "horned" yielded from 30 to 40 cents. When the ledge from which this came is found, it is expected to equal if not surpass the famed Standard of Bodie. The largest and longest continuous vein yet proved is that on which the Ridgeway, Hard-Tack, Head-Light and Claremont locations, covering 6,000 feet, have been made. Its general course is north-east and south-west. The Ridgeway, at the south-western end, has an incline down 200 feet, at an inclination of 22 degrees, with 100-foot drift at bottom. While the ledge on the surface was only 4 inches, it now shows a four-foot average between walls at the water-line, with from 12 to 30 inches of quartz—an average of about 20 inches—which goes $100 to the ton. Good work is being done on the Ridgeway under the efficient management of Geo. Dean, superintendent. In addition to work in the incline and drift, a tunnel is being run 200 feet which will strike the lode at a depth of 240 feet, giving drainage and ore delivery 140 feet below the surface. In the Hard-Tack, adjoining Ridgeway on the north-east, there is an incline of 140 feet, at the bottom of which the ledge shows from 16 to 24 inches between walls, mostly quartz. The incline is about the same as the Ridgeway and like it the ledge at the surface was only from 2 to 4 inches, gradually increasing as it goes down. This mine is the property of Ladd & Clements, the latter of whom informed us that all the ore crushed had averaged a little over $90 to the ton. The same gentleman is authority for the statement that from 1000 pounds of Hard-Tack rock he pounded out $287, and from specimens shown there can be no doubt of the accuracy of the statement. It is difficult to find a piece of rock in the lode which does not show gold. The Head-Light, belonging to Tom Baker & Co., and the Claremont, George Dean's, lying in the north-east of the Hard-Tack, have not been worked except to prove that the vein is in place and good. Adjoining the Ridgeway on the south-west is the North Star, one of some 20 locations belonging to the New River Development Company of Eureka. They are running a tunnel on this location with every prospect of striking the lode of which the four mines above mentioned are a part, and which when found will increase its known length to 7,500 feet. The lode is high on the hill above Slide Creek. The Tough-Nut, Thomas Baker & Co., nearer the creek and running parallel, has some splendid quartz and we learned that the vein is well-defined though small with every indication of widening as they sink on it. This company had just completed a splendid double arastra and started it up the day we left for home. The Uncle Sam has a steam-mill with five small stamps and are said to be doing good and satisfactory work. The Mary Blane also has a stamp-mill with steam-power and saw-mill attached, but work has not been resumed this spring on account of snow, it being located high above the other mines, on the Salmon divide, part of the location being in Siskiyou county. New discoveries are being made daily in that section, frequently several miles apart. The next evening after our arrival a prospector came in with a large crystallization literally covered with gold, and for which he was offered $10 by a gentleman who wanted it for a cabinet specimen. It was from a lode he had found that day at Rocky Point, on the north side of Potato Hill, about 5 miles distant from White Rock. It was also stated that several strikes had been made at Methodist Creek, on the Salmon side of the divide and that a new district was about to be formed there for the convenience of miners. The lodes were reported at 4 to 8 feet in width. Messrs. Fleming & Fitzgerald, old and responsible prospectors who represent Eureka capital, are investigating this new section which is 12 miles from White Rock. To sum up New River District, from our brief and by no means thorough investigation, it is a most promising quartz field, and gives every encouragement for the hope that it will prove rich and lasting. There are at present about 400 men in at the mines, engaged in prospecting, getting out timber, etc. There is no use in men going there in seach of work, for there are already as many or more there than can find employment in the present condition of affairs. Wages are $50 per month and board. There is an abundance of provision and pack-trains are running from Eureka, Scott Valley, and North Fork in that county. Mines are plenty, but capital for development is needed to crowd work and give to the section that activity and prosperity which its richness seems fully to warrant. It might be here stated that already the representatives of large mining capital are already there and preliminary steps have been taken for the purchase and operating of several of the best mines. New River is a splendid field for the intelligent prospector—a man who understands hunting for quartz and who has enough money to carry him through the summer. For such men the chances of striking it rich and making a fortune are more than good.

Tuolumne.

MILL RUNNING.—*Union Democrat*, March 28: The new mill of Lang & Shaw on the Kanaka mine, near Groveland, has been completed, and has been running nearly all the week. It does the best of work, and is complete in every respect. The only drawback at present is the lack of water which prevents the mill from being run on full time. The mine is looking very well, the vein is of good size and easily worked. The quartz contains a considerable percentage of sulphurets, which are saved by a Schofield concentrator.

SALE.—Tuolumne *Independent*: We hear that Dr. Drake has at last succeeded in selling the Hyde mine, to an Oakland party—Messrs. Isaac W. Knox, T. Alexander and M. P. Ross—but it is not altogether a cash transaction, being on the deferred

payment system. A payment of $500 has been made and a bond given for a deed to be executed on the 1st of July next, the parties having the privilege to work the mine in the meantime. It is more than probable that a 20-stamp mill will very shortly be set up, if everything proves satisfactory.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, March 28: Cross-cut No. 3, on the 2900 level, was in 40 feet last evening, 30 feet of which was in a vein of good milling ore, containing bunches and streaks of a rich black sulphuret and chloride character, and the face still continues in the same, with no indication of west wall as yet. Cross-cut No. 2, 50 feet south, showed eight feet of good ore, all of which indicates that the ore is widening as it goes toward the Savage ground, which is not far off—about 150 feet. All of which may be considered a favorable circumstance, so far as the Savage is concerned. On the 3000 level the north lateral drift is 180 feet in length, and a cross-cut west from it to toward the ore vein was commenced on Wednesday last, three cross-cuts being projected, of which this is the middle one, or No. 2. This being well started in, is temporarily discontinued, and yesterday cross-cut No. 3, at the north end of the level, was started. Cross-cut No. 1, at the south end, will be started shortly, it being the intention to run all three of these cross-cuts west simultaneously into the ore vein.

CON. CALIFORNIA AND VIRGINIA.—The 1750 level still continues to yield a considerable amount of paying ore, yet not sufficient to keep the Morgan mill running, consequently the mill is now waiting for an accumulation of ore. The 1550 level, being worked under the Jones lease, is turning out ore enough to keep the Eureka mill running steadily and remuneratively.

CROWN POINT.—The old upper workings above the 1700 level continue to send forth numerous tons of low-grade ore to the mills on the Carson river. Owing to the growing scarcity of water in the river, however, quite a number of men have had to be discharged recently, consequently the yield of ore is somewhat decreased.

SIERRA NEVADA.—The old surface machinery is being put in working order, and will be ready to start up on the first of next month, when the old upper levels will be reopened, and thorough prospecting at that point inaugurated.

ALTA.—Running the lateral drift north on the 950 level progresses, and cross-cut No. 2, west from this drift, is now in 18 feet. The water of the flooded lower levels has raised up to the 1250 level, and is still slowly rising.

KENTUCK.—The 1300 level continues to yield a good grade of gold-bearing ore, which is reduced at the Rock Point mill on Carson river. The old upper levels still continue to yield a goodly quantity of fair grade ore.

YELLOW JACKET.—More men are employed in this mine than any other on the Comstock, extracting low-grade ore from the old upper workings, which is milled on the Carson river.

OVERMAN.—Good work is being done in the old Lambert tunnel, which has been put in order, and is being driven forward into the low-grade ore of the upper workings.

BULLION.—A drift is being run into the croppings, from about the level of B street, to test the merits of the low-grade ore known to exist in the upper part of the mine.

CHOLLAR.—Cross cutting west on the 3000 level, near the south line of the Hale and Norcross, and getting into near proximity to where the ore vein is expected to be found.

WOODVILLE.—Some good pay ore is being extracted from this mine, on the 300 and 400 levels, by Charles Lyons, working on tribute, employing about 14 men.

BELCHER.—Considerable ore of a fair grade is being taken from the old upper workings, through the Crown Point.

Castle Dome District.

THE NEW MINES.—*Silver State*, March 28: Late reports from the new mines recently discovered near Buffalo Springs, on the Idaho road, confirm what has hitherto been said of their richness. W. A. Rodifer, who discovered the Bullion mine at Spring City, Lew. Morse and Pink Boyd have located a lead, some specimens from which assay as high as $13,000 per ton. Charles Kemler, who arrived yesterday from Paradise, says the new discoveries have created considerable excitement in that section. Half a dozen assays of as many specimens averaged over $7,000 per ton. The district in which these new mines are situated was organized some time ago by Paradise prospectors and named Castle Dome. It is in what is called the Mount Rose range, and is about 35 miles north from Winnemuca near the Idaho stage road.

Esmeralda District.

THE ANTELOPE MINE.—Walker Lake *Bulletin*: March 25: Seawell and Newton have completed the tunnel to the old workings in the Antelope mine, and have now 5,000 tons of good ore in sight. This ore will probably be reduced for a time at the mills already at Aurora, but if the tunnel is continued as now contemplated and the result is as predicted by those who knew the mine in early days, a new mill will have to be erected.

WORK RESUMED.—The Silver Hill mill at Aurora, begun to-day crushing ore from the New Esmeralda group of mines, on which a force of men has been engaged during the past winter running levels and preparing the workings for the extraction of ore at a rate which would keep the mill running steadily for the coming season.

ARIZONA.

MOHAVE.—*Miner*, March 29: The Mulligan Bros. have a foot of good ore in the Flagstaff mine at Corbat and will do well out of it. James Twiggs is working on the Standby mine between Stockton and Corbat, on a lease. John Hughes and Anson H. Smith are working on the Constellation; a valuable mining claim near Stockton. Messrs. Cole and Caffrey have a force of men at work on the Alpha mine, and are taking out the usual grade of ore. The Hackberry mine and mill have closed down under the present management for an indefinite period. At present writing there are five men chloriding in the mine. W. C. Parsons, the well-known Tombstone capitalist, has sent up a couple of men from Tombstone to work on the Floro mine.

TAILINGS.—Prescott *Courier*, March 30: The fine ten-stamp mill of the Peck company, at Alexandra, in this county, is being fixed up for a long run on Peck tailings. Mr. W. C. Dawes has a lease of the mill and the right to work the tailings. He has had them assayed and sampled, has engaged a good mill man and will, undoubtedly, make money out of them. These tailings have been exposed to the weather for years and may yield their treasure freely. The mill is located in a splendid mining region, convenient to a great many ledges which contain gold as well as silver, so that there is great hope of a lasting boom in that section. Meeting Mr. Craigue on the street, we questioned him concerning prospects at the Sterling. He assured us that the old mine is looking first rate. His men are now driving a winze. The vein is very large and the ore carries sufficient gold to pay for fooling with it. The company will, ere long, have a 15-stamp mill crushing the ore. The Sterling is about five miles south of Prescott, in the pine timber. Under-Sheriff M. L. Lawler is in receipt of a letter from his friend E. G. Wager, of Humbug district, in which the writer states that the Humbug mill is doing well on silver ore and will very soon be set to work crushing gold rock. No new strikes are reported, but old ledges are yielding considerable rich ore. Returns from placer mines now being worked are very cheering. Tracy's placer, Hassayampa creek, is yielding plenty of coarse gold, so are the Lynx creek hydraulic and sluice diggings and the diggings near Walnut Grove and Weaver. Riggs & Co. have made a good clean-up, on the lower Hassayampa. Black canyon claims are rewarding those who are working them. Messrs. Sam Bright and Geo. E. Berry find trouble in getting to the bed-rock in their claims on Groom creek, but prospects which they get out of loose gravel are very encouraging.

RUNNING.—*Silver Belt*, Mar. 27: The Miami is running this week on 11 tons of silver ore from the Cotton Tail and 23 tons of gold ore from the Golden Gate mine, belonging to S. Klein. The clean-up will be made to-day and it is expected that about $2,000 will be realized from both lots of ore. The Cotton Tail ore went 44 ounces, which is 14 ounces more than was expected, and the value of the Golden Gate ore also exceeded the expectations of the owner, 5 ounces, yielding 23 ounces per ton. Messrs. Tebbs, McCabe, Fredericks & Warnick have nine men employed taking out a ditch 600 yards long to their placer claim, situated in the gulch adjoining and to the north of Chaffin and Phillip's location. They will get their water from the gulch leading down from Bemen's saw-mill. They expect to have the ditch completed inside of ten days. Messrs. S. Klein & Co., have shipped three bars of silver to San Francisco last Saturday, the product of ore worked at the Miami mill, from W. V. Kingsbury's mine; the Peacock, owned by J. C. Coplin, and the Neilson, owned by Garlinghouse and Lynch. Total value of bullion $700. On Wednesday last Klein & Co. shipped another bar valued at $250. The owners of the Cotton Tail are so encouraged by the returns of the ore worked at the Miami mill that they will take out 100 tons from their mine. They have a large body of ore which will go 44 ounces and over in silver. Walter Fitzsimmons has taken out a quantity of silver ore from his mine near Dripping Springs, which he will bring to Globe to have worked at the Miami mill. The ore will go over $500 to the ton.

COLORADO.

ELK MOUNTAINS.—Elk Mountain *Pilot*, March 22: There is a rumor afloat that Moffat, the Gunnison smelter man, will remove his smelting plant from there on account of some local differences. Work on the Daisy lode was begun last Tuesday. It is the property of Alexander Gullet and Dr. R. C. Evans and is located in the head of Evans Basin, near Elk peak. There is about 70 feet of work done upon the claim and they will begin taking out ore at once, which will be shipped as soon as possible. They expect to do a large amount of development work this summer. Milt Dale went up to his claim (the Betsy) in Washington gulch, last Friday and brought down some ore for a test. He says they have about 18 inches of 50 ounce ore, and thinks he can make it pay well to work extensively.

CRYSTAL CITY.—James Sprague is sinking a shaft in the Milwaukee tunnel on some splendid, rich ore. The Detroit cross-cut is in 40 feet from the shaft and the vein is expected to be cut soon. The Belle of Titusville is in decomposed mineral and they are approaching another larger vein, which they expect will show up a big vein of mineral. Good reports come to us from the carbonate claims at Rock creek hot springs. Ed. Gift has four to five feet of lead and carbonate ore, and is a splendid looking property. They have one foot of solid lead and between three and four feet of carbonate ore. Andy Anderson has run 200 feet on his claim this winter, and he has some fine looking ore. Bob Corey has a good vein on White House mountain which is improving with depth. Snow on the south slope of Sheep mountain, and Mineral Point, is melting fast, and claims can be worked within ten days on the side hill. Frank Edgerton is troubled with bad air in the Lulu tunnel and can only work half time. We expect to see work start up soon on our smelter which will bring this camp to the front.

MONTANA.

LEXINGTON.—Butte *Inter-Mountain*, March 26: Operations in the Lexington are confined mainly to the extraction of ore from the 400 and 500-ft levels and to the extension of the drifts from the face of the 650-ft south crosscut. The character and amount of ore in the deepest workings is not known. It is ascertained, however, that the product is more refractory than usual, though that will not prevent Mr. Wartenweiler from working it to a high percentage. Sinking from the 650 to the 800 ft level will soon be resumed and for the active prosecution of the work an air compressor is now being erected and is expected to be in operation within two weeks. Diamond drills will be used, and the 800 ft station, will soon be reached.

ALICE.—Extensive preparations are apparent at the Alice for the active development of the company's mines. The Cornish pump, the largest and most perfect piece of machinery in the west, is running with remarkable smoothness and is fully able to meet all demands upon its capacity. There is therefore no further obstacle in the way of deeper exploration. A new hoist will also be put in by Frizer & Chalmers capable of sinking to a greatly increased depth.

MAGNA CHARTA.—The Magna Charta shaft, which for some distance is large enough for only two compartments, is now being increased in size so that it will contain three compartments. As soon as this has been accomplished a Cornish pump will be shipped up from Utah and started into operation. It is estimated that the new Alice pump saves the company between $50 and $60 per day in fuel alone.

MOUNTAIN VIEW.—This mine is a steady shipper of crude copper ore, of which it has more in sight perhaps than any other copper property in the district with the exception of the Anaconda. The north and south veins from the 400 to the 600 ft levels inclusive show vast reserves of ore, upon which a 100-ton smelter would scarcely make an impression in a year. A new strike was made a few days ago in the 600-ft west drift of the north vein where a solid body of copper glance 6 ft wide assaying 76 per cent was opened up. No better or more compact body of ore was ever found in this or any other district, and Mr. Larabie is making preparations for some heavy shipments of it.

NOTES.—The Clear Grit is making regular ore shipments of 25 tons daily to the Colorado smelter. The Stevens is shipping 20 tons of $40 ore daily. The Bluebird is said to show one of the longest continuous ore shoots in the district. The product is generally a carbonate containing some lead. The dump is assuming stalwart proportions. The Silver Safe and Rising Star are both being actively developed. The Rising Star people have already done 1500 ft of work; the Silver Safe shaft is making a bee line into the ground on good ore.

THE OUTLOOK.—The mills and smelter now in full blast on Butte ore are as follows: Alice, Moulton, Silver Bow, Lexington, Dexter and Old Lexington, and the Anaconda, Colorado, Bell, and Montana smelters. If necessary arrangements can be made, the Parrot will not much longer be idle. The silver interests of Butte never looked so well as they do today, and the present production of all kinds of ore was never before equalled.

ANOTHER RICH LODE.—Helena *Independent*, March 26: The Helena Lode the property of Raleigh & Clarke, S. T. Hauser and T. H. Kleinschmidt, situated about 4 miles west of Helena promises to be one of the best bonanzas in the country. A 75-ft shaft is now upon the lead, and 5 ft of good paying ore is shown. We were unable to learn the value of the ore, but received sufficient assurance from the fact that the company are constantly shipping ore to Wickes for the purpose of being worked that handsome dividends are declared. The most favorable thing in connection with the lode is that it is greatly composed of carbonates, a feature that adds considerable to its value, considering the fact that the great boom of Leadville was occasioned by the immense amount of the same class of ore found in that district which proved so rich. A large number of men under the management of George Cleveland are now busily engaged in developing the property, and that the mine will be one of the best in the Territory is considered beyond a doubt. There are a large number of new discoveries in the vicinity of the Helena lode which show strong indications of oxides of iron and carbonates.

NEW MEXICO.

MALONE.—Silver City *Enterprise:* More work has been done on the Young Man than upon any other property in the camp. It is owned by a California company, who have done considerable development work and have taken out a large amount of ore since they took charge of the property. The mine has been opened at some seven or eight places, and at every point shows good ore. It is said that the company will soon erect a mill, but of this we have no positive information, as the superintendent states that the company do not care to have their property mentioned in the papers. There are many other mines in the camp that show good ore besides the Young Man, but owing to the exceedingly bad weather we personally examined only a few, located on the dyke between the gulch and the Young Man. The Walapise is only a short distance from the gulch. The gangue is quartz and talc, carrying horn silver and sulphurets. A five-foot breast of ore has been uncovered, an average assay of which shows it to run over $100. No mill return has yet been had from this claim. Considerable work has been done on the Walapise, and from the showing made it is considered one of the best claims in the camp. The Last Location and Heraldston come next. In the first one the contact is about 40 ft wide, from almost any part of which an assay can be had. Very little work has been done on either of the claims, but the surface indications are certainly all that could be desired.

SILVER.—Silver City *Enterprise*, March 26: Nineteen silver bricks were shipped from the Mimbres Company's mill last week. About 25 men are engaged on assessment work and taking out ore in Hanover gulch. The ore of that camp is of a very desirable character for the smelter here. Jacob Long and Charley Cox have located a claim in Hanover gulch which they have called the Little Mamie, and have sunk a shaft 17 ft deep upon the ore vein which assays $30 in gold. The surface rock runs but $5 and at the present depth it will pay its owners well to work. The vein is 18 inches in width. John A. Miller has made arrangements to put up a 10-stamp mill upon the Peacock property, in the Mogollons, and it is likely the machinery will be here in a very short time, as we understand it is Mr. Miller's intention to ship it before he leaves San Francisco.

OREGON.

PLACERS.—Bedrock *Democrat*, March 23: Owners of placer mining properties throughout Baker county, are starting in this spring with renewed energy, and the output of the precious metal gives promise of large amounts. We are glad to know that at last men of enterprise are turning their attention to the gravel deposits of Burnt river. It has been supposed for many years that deep gravel beds that would pay for working existed on Burnt river, but prospectors have been loth to experiment, and only within the last few seasons, have these supposition come within verifications and now that a start has been made, we have no fear but that the great Burnt river country will do its share toward adding to the mineral wealth of Baker county. At Mormon Basin, Colt & Co, are making extensive preparations to put in a good season on their valuable ground. These diggings have been worked for many years, turning out thousands of dollars profits. They work their ground on the latest improved plan—with numerous "Little Giant" hydraulics, and it is a novel sight to witness the tearing down of large banks of gravel by this modern process. Blair & Glover, of the same camp, have several hundred acres of patented placer ground, and this season intend to work them on a scientific principle, and as the larger portion of the ground has been well prospected, they are confident of realizing large returns. They will employ a large number of workmen. At Clarksville, Wm. Neabuhr, will continue the working of the same placers that have been operated by him for many years, and out of which he has made an independent fortune. The claims still prospect well, and no doubt will come up to the standard of former seasons. The creek claims, recently purchased from J. W. Virtue by a large company of Chinamen, and containing several hundred acres of patented ground will be operated this season. Already the Celestials are setting their hydraulics, and making other needed preparations. At Malheur, Mr. James Lynn, will this season operate on some of the most valuable ground in the camp. About a dozen other sets of claims will be worked in this camp this season, and all promise good returns. Work will be commenced as soon as water is brought through the great El Dorado ditch, which will be in operation in a short time if good weather continues. The New England Mining Company John W. Drew, Supt., of Rye valley, will employ an enlarged force of workmen on their mining claims this season. This company is composed of New Hampshire capitalists, and we are informed they are thoroughly satisfied with their investment. Under the management of Mr. Drew, the output from these claims, will be larger than ever, and redound largely to the advertisement abroad of our vast mineral resources. Osborne & Co. have had a large force of workmen employed all winter putting in a ditch about 5 miles in length to cover a large belt of gravel claims situated on the banks of Snake river, below the mouth of Connor creek. The ditch is not yet completed but will be in a short time, when some very extensive mining may be looked for. Near & Sisley, of Connor creek, have already commenced operations, and have very flattering prospects. The mines of Salmon creek, situated 8 miles west of Baker City, are the most extensively worked placers in the county, the several owners of sets of claims being Nelson & Co., Carpenter & Jones, Wm. Daily, with about a dozen other miner companions. The Nelson claims will commence operations next Monday, and it is the intention of the owners to put on the largest force of workmen ever employed, besides more extensive improvements for the successful taking out of the precious metal. Indeed, the managers of these diggings are up to all the latest scientific principles of mining. At Fort Sumpter, as soon as Kimbol & Young succeed in getting the spring flow of water through their ditch, more than a dozen different placer claims will commence operations. Sumpter is one of the oldest camps in the county and its claims have been worked constantly for a quarter of a century, and yet hundreds of acres of rich gravel deposits await their working by the hardy miner. This camp has never failed in turning out its share of wealth every season, and now that every improved method for working is operated at the present day, this year promises even richer rewards than its predecessors. At Auburn, the Marysville Mining and Ditch Company, expect to get water through their immense canal about the first of the month, providing fine weather continues. This company besides operating large water supply, also employ a large force of workmen on several sets of placer claims and this year intend operating them on a more extensive scale than ever. The claims of Auburn have been constantly worked since their first discovery in 1862, and millions of dollars have been added to the wealth of the country. The placers still prospect well, and may continue to pour out their richness for years to come.

ANOTHER STRIKE.—Bedrock *Democrat:* Last winter, George Beber, an old California and Colorado prospector, struck a fine body of good prospecting gravel on a high bar in an old channel of Burnt River. The bar is over 1,000 ft in hight, facing the river, and runs back into the gravel hills sloping from the Myrick mine and Rye valley. It prospects from two to ten cents to the pan in seven feet of blue gravel. Eighty acres have been taken up by Beber, Cooper, Willard and Gray. Yesterday, C. M. Foster went out to survey the ditch to take on the water from Shirt Tail creek, when an extensive placer mine will be opened, which will in a measure, benefit Baker county. Since the above was written we understand that a Mr. Porter has purchased the land and ditch, the purchasing price being $1,000.

UTAH.

REVIEW.—Salt Lake *Tribune*, March 26: The week has been mild and pleasant, but the movement of the metals has been extremely light. The receipts of ore were light, both from Utah and Idaho, the hills in this Territory being too much snowed under to ship freely, and in Idaho the miners' strike practically stopping production for the time. The shipment of bullion and ore out from this city for the week ending Saturday, March 21st, inclusive, were—59 cars bullion, 1,328,400 pounds; 8 cars ore, 242,700 pounds; total, 67 cars, 1,571,100. The receipts of ore and bullion in this city for the week ending March 25th, inclusive, were—of bullion, $44,523.44; of ore, $5,275; total, $49,798.44. The week previous the receipts were $79,422.65 of bullion and $9,950 of ore. The Ontario produced during the week 49 cars of bullion, $38,558.14, bringing the total product of the year to date up to $398,955.52. The usual monthly dividend of 50 cents a share, being the 105th of that amount, has been declared, amounting to $75 000; total dividends this year, $225,000. Two bars of Christy silver were received during the week, valued at $3,115.30. The Stormont added one bar, $2,850, making a total for the Reef during the week of $5 965.30. Ore receipts were $2,600 from the Crescent, Utah, and $875 from the Minnie Moore, Idaho; also $1,800 Idaho ores.

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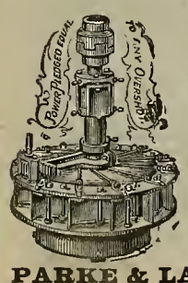

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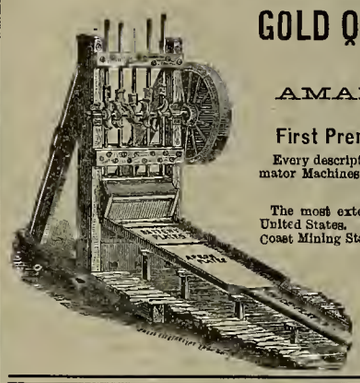

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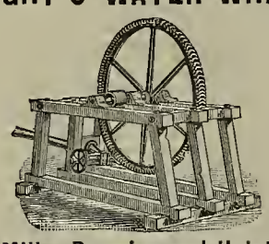

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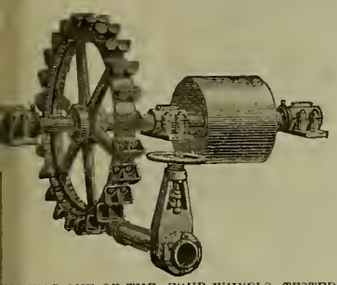

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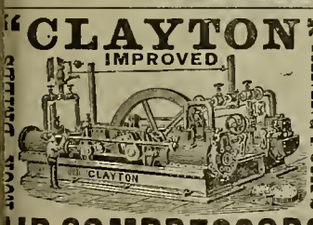

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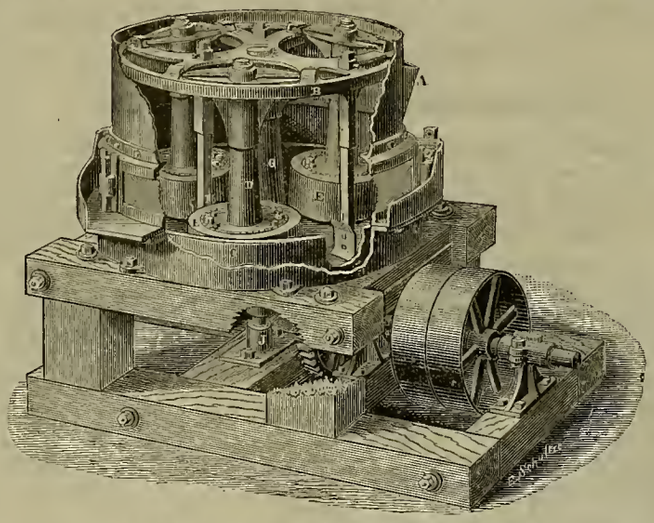

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List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING MARCH 24, 1885.

314,332.—WIRE FRUIT JAR FASTENING—W. F. Hannes, Oakland, Cal.

314,335.—BICYCLE—Thos. Johnston, S. F.

314,337.—ICE MACHINE—J. C. Kitton, S. F.

314,456.—ARMOR FOR VESSELS, ETC.—W. N. Le Page, S. F.

314,398.—MOLD FOR CONCRETE STRUCTURES—E. L. Ransome, Oakland, Cal.

314,300.—SACK HOLDER—J. W. Rush, Stockton, Cal.

314,496.—CAR COUPLING—A. W. Van Dorston, Salem, Or.

314,227.—GENERATING STEAM BY ELECTRICITY—Vaughn & Eldridge, Stockton, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

BICYCLE.—Thomas Johnston, S. F. No. 314,335. Dated March 24, 1885. This improvement consists in a hand crank located above the head of the machine, and in a connection between the said crank and cranks on the axle of the front wheel, said connections having stirrups upon them for the receptiou of the feet, whereby through the joint action of hands and feet the bicycle is propelled.

ICE-MACHINE.—John C. Kittou, S. F., No. 314,337. Dated March 24, 1885. This invention relates to certain improvements on a former one patented by Mr. Kitton; and it consists mainly in a series of open-ended chambers supported with in a tank, so as to be surrounded by a freezing medium; packing plates by which the fresh water within the chambers is prevented from coming in contact with the freezing medium without, and a space or chamber surrounding and hclow the refrigerating chamher, and with which the ends of the freezing chambers communicate for the purpose of depositing the impurities of the water, so that they will not he contained in the ice after it is formed. The invention also consists in certain details of construction, and in a means of producing a circulation of water through the chambers while the freezing is going on.

GRAIN CLEANER.—Daniel Best. No. 313,911 Dated March 17, 1885. This invention relates to certain improvements in secondary grain cleaners, such as are usually employed in connection with thrashing machines and separators, for the purpose of completing the cleaning on a large scale, and in a siugle continuous operation, of grain which has already heen partially cleaned in the separator. It consists of an attachment to receive the grain which has heen blown or carried to a point near the discharge end of the riddles of the machine, and which, falliug through these riddles, is received in a transverse spout at the bottom. In this invention this spout discharges into a conveyor, hy which this lighter grain may be either discharged into the spout which hrings the grain from the separator or into the elevator which carries the grain upward and discharges it into the hopper at the top of the machine, or when seed-wheat is heing cleaned the discharge from the spout may he conveyed away into sacks, so as to be again returned to the apparatus.

ILLUMINATING BASEMENTS.—Peter H. Jackson, San Francisco. No. 314,026. Dated Mar. 17, 1885. The patent covers improvements in the illumination of hasements of buildings hy mcans of glazed tile. It consists of tile made in patterns of such a description that they can be kept in any quantity and in stock and ready for use upon any building without regard to the regularities of outline or regard to the contour of the building front; and in connection with these, of similar plates which may be either plain or glazed which will he fitted to the outline or contour of the building or where the tiles are to he used. Together with this Mr. Jackson employs certain means for supporting the different parts, joining them to each other, and forming joints between them which will not leak. It is usual where a new building is to he constructed, and illuminating tiles or iron work is to he fitted to the pavement or sidewalk in front of the building, to wait until the columns, sills and risers are placed in position before the tiles are constructed, in order to make good joints and a close fit between parts. This is uecessary because these parts of the iron work rarely come into the exact place which is designated by the drawings, owing to the slight change in form on casting the metal, or from other reasons. The tiles are then fitted to the irregularities of the contour of the front of the building, and are then glazed and placed in position. Mr. Jackson's invention contemplates the construction of tiles of certain length, made preferably of rectangular form, so that they can he laid in front of the huilding without regard to the contour, and with these, of supplemental irregular plates or tiles, one edge of which will be fitted against those already described, while the other may be fitted to the contour of the buildings.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCA	N.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Andes S M Co	Nevada	26		25	Mar 2	Apr 8	Apr 30	B Burris	309 Montgomery st
Belmont M Co	Nevada	39		15	Feb 11	Mar 21	Apr 13	J W Pew	310 Pine st
Con Amador M Co	California	9		50	Mar 16	Apr 15	May 1	F B Latham	408 California st
Daisy Cement M Co	California	3		2	Mar 28	May 5	May 27	O J Collins	512 Montgomery st
Excelsior W and M Co	California	7		50	Sept 2	Apr 13	Apr 28	W J Stewart	215 Sansome st
Golden Channel M Co	California	2		01	Feb 12	Mar 26	Apr 21	A B Paul	328 Montgomery st
Hale & Norcross M Co	Nevada	84		50	Mar 2	Apr 7	Apr 28	E B Holmes	309 Montgomery st
Homeward Bound Pl M Co	California	3		15	Feb 21	Mar 12	Apr 6	D A Smith	209 Post st
Horseshoe M Co	California	4		2	Mar 9	Apr 11	Apr 27	A Berg	Grass Valley
Indian Spring Drift M Co	California	5		03	Feb 19	Mar 23	Apr 23	A B Paul	328 Montgomery st
Mayflower Gravel M Co	California	29		10	Mar 26	May 9	May 29	J Morizio	328 Montgomery st
Mexican M Co	Nevada	29		25	Feb 24	Mar 31	Apr 21	C E Elliott	309 Montgomery st
Nocbe Buena M Co	Mexico	1		11	Mar 27	May 8	May 23	C Hart	106 Battery st
North Star G M Co	California			1.50	Mar 5	Apr 9	May 1	D A Jennings	401 California st
North Banner Tunnel Co	California	6		½	Feb 7	Mar 13	Apr 7	T J Mitchell	Grass Valley
Ophir M Co	Nevada	49		50	Feb 18	Mar 24	Apr 13	E B Holmes	309 Montgomery st
Pittsburg M Co	California	19		5	Feb 28	Apr 25	May 15	C J Bandmann	210 Front st
Rainbow M Co	Cal forcia	13		15	Mar 14	Apr 2	May 20	P F Mobrhardt	307 Montgomery st
Rocky Bar M Co	California	8		25	Feb 18	Mar 24	Apr 13	G W Hill	Grass Valley
Sulpbur Bank Q M Co	California	3		50	Feb 25	Apr 16	Jun 1	L Hermann	220 Sansome st
Sierra Nevada M Co	Nevada	81		25	Feb 18	Mar 25	Apr 14	E S Parker	309 Montgomery st
Summers Con M Co	California	3		05	Mar 17	Apr 20	May 12	F E Luty	330 Pine st
Tower Con M Co	California	2		10	Mar 11	Apr 15	May 5	G W Sessions	309 Montgomery st
Union Con M Co	Nevada	29		25	Feb 16	Mar 24	Apr 14	J M Buffington	309 California st
Yosemite M Co	California	2		2½	Feb 7	Mar 16	Apr 21	J Welsheim	Grass Valley

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Bulwer Con M Co	California	W Willis	309 Montgomery st	Annual	Apr 8
Champion M Co	California	T Wetzel	522 Montgomery st	Annual	Apr 10
St George M Co	Nevada	A W Rose Jr	309 Montgomery st	Annual	Apr 6
Tioga Con M Co	California	G W Sessions	309 Montgomery st	Annual	April 13

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Kossuth M Co	Nevada	C K Sturtevant	328 Montgomery st	06	Mar 16
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Feb 13
Plymouth Con M Co	California	W Van Norden, Pres	23 Nassau st, N Y	50	Apr 6
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Feb 16

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE. Mar 26-Apr 1	Portland. Rain.	Temp.	Wind.	Weather.	Red Bluff. Rain.	Temp.	Wind.	Weather.	Sacramento. Rain.	Temp.	Wind.	Weather.	S.Francisco. Rain.	Temp.	Wind.	Weather.	Loe Angeles Rain.	Temp.	Wind.	Weather.	San Diego. Rain.	Wind.	Weather.
Thursday	.00	60	S	Cl.	.00	68	S	Cl.	.00	66	S W	Cl.	.00	62	NW	Fr.	.00	70	W	Fr.	.00	65	NW Fr.
Friday	.00	56	W	Cl.	.00	73	N	Cl.	.00	66	NW	Cl.	.00	60	S W	Fr	.00	73	W	Cl.	.00	65	W Cl.
Saturday	.00	56	NW	Cy.	.00	72	S	Cl.	.00	67	S W	Cl.	.00	57	NW	Cl.	.00	78	W	Cl.	.00	65	W Cl.
Sunday	.00	58	NW	Cl.	.00	75	S	Cl.	.00	66	S W	Cy.	.00	58	S W	Cy.	.00	70	W	Cy.	.00	64	W Cy.
Monday	.30	64	N	Cl.	.00	68	N	Cy.	.00	63	NW	Fr.	.00	60	S	Cy.	.00	71	W	Fr.	.00	66	W Fr.
Tuesday	.—	58	S	LR.	.—	64	S	Cy.	.07	65	NW	Cy.	.18	65	S W	Cy.	.00	74	W	Cy.	.00	67	W Fr.
Wednesday	.—	62	W	Fr.	.00	68	E	Fr.	.—	68	W	Cy.	.—	6	S W	Cy.	.00	72	W	Cl.	.00	67	NW Cl.
Totals	.—								.07				.24				.0				06		

EXPLANATION.—Ct. for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature wind and weather at 12:00 M. (Pacific Standard time), with amount of rainfall in the preceding 24 hours.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Mar. 12.		WEEK ENDING Mar. 19.		WEEK ENDING Mar. 26		WEEK ENDING Apr. 2.	
Alpha	....	.70	....	.60	.60	.65	.75	.80
Alta	.30	.25	.30	.15	.25	....	....	.25
Andes	.10	.15	....	.10	....	.05	....	.05
Argenta	....	....	....	....	....	....	....	....
Belcher	....	.70	....	.75	.75	.80	.75	.85
Belding	....	....	....	....	....	....	....	....
Best & Belcher	1.05	1.20	1.05	1.10	.90	1.05	1.05	1.15
Bullion	....	....	....	.20	....	.25	....	.25
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	.20	....	.15	....	....	....	....
Bodie Con	2.25	2.45	2.10	2.30	2.10	2.30	1.95	2.20
Benton	.05	.10	....	....	....	.05	.05	.10
Bodie Tunnel	....	....	....	....	....	....	....	.30
Bulwer	....	.35	....	.30	.35	.40	.30	.35
California	.40	.90	.30	.45	.35	.40	.40	.45
Oballenge	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Chollar	1.90	2.35	1.85	1.95	1.65	2.00	2.05	2.15
Confidence	....	.80	....	.70	.75	.80	....	.80
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.40	.90	.30	.45	.35	.40	.40	.45
Con. Pacific	....	1.00	....	1.00	....	....	....	....
Crown Point	.70	.80	.70	.80	....	.75	.80	1.00
Day	....	....	....	....	....	....	....	....
Eureka Con	....	....	4 10	5.00	....	....	3.35	4.00
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	....	.25	....	....	....	.25	....	.25
Grand Prize	.35	.40	....	....	....	....	....	....
Gould & Curry	.80	.95	.75	.85	.70	.80	.85	.95
Goodsbaw	....	....	....	....	....	....	....	....
Hale & Norcross	4.95	6.00	5.12	5.75	4.85	6.00	5.50	6.12½
Holmes	4.60	5.00	....	5.00	....	....	4.75	4.80
Indepeudence	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	....	....	....
Justice	....	....	....	.15	....	....	....	.15
Martin White	....	....	....	.50	....	.85	.60	.65
Mono	1.35	1.45	1.25	1.35	1.20	1.30	1.05	1.15
Mexican	.35	.40	.20	.35	.15	.25	.45	.50
Mt. Diablo	....	3.70	3.75	3.90	....	3.85	....	....
Northern Belle	....	....	....	....	....	....	....	....
Navajo	1.00	1.10	1.05	1.10	1.10	1.15	1.05	1.10
North Belle Isle	....	....	.20	....	.20	....	.15	....
Occidental	....	1.00	....	.95	....	.85	....	....
Ophir	.20	.25	.10	.20	.55	.60	.50	.55
Overman	....	.15	....	.20	....	....	.15	.20
Potosi	.85	1.60	.80	.90	.75	.90	.90	.95
Pinal Con	....	....	....	....	....	....	....	....
Savage	1.20	2.05	1.85	1.95	1.85	2.30	2.25	2.75
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	.35	.40	.25	.40	.25	.50	.40	.55
Silver Hill	....	....	....	....	....	....	....	....
Silver King	....	4.50	....	....	3.25	3.75	....	3.40
Scorpion	....	.10	....	.10	....	.10	....	.10
Syndicate	.45	.50	....	....	.40	.45	....	.40
Tioga	....	....	....	....	....	....	....	....
Union Con	.30	.3	.15	.30	.40	.45	.45	.50
Uta	....	....	....	.60	....	....	....	....
Yellow Jacket	....	1.30	1.25	1.30	1.25	1.35	1.00	1.95
	....	....	....	....	....	....	....	....

Bullion Shipments.

Christy, March 26, $1,550; Ontario, 26, $18,952; Minnie Moore, 26, $875; Mt. Diablo, 22, $12,129; Christy, 29, $1,560; Honerine, 29, $4,060; Hauauer, 26, $37,200; Crescent, $1,960; Stormont, 27, $3,100; Wood River ore, 27, $1,100; Contention Con. 31, $9,938. The banks of Salt Lake city report the receipt for the week ending March 25th, inclusive, o $44.523.44 in bullion and $5,275 in ore; a total of $49,798.44.

PANORAMA visitors should he provided with Muller's Opera Glasses, 135 Montgomery St., near Bush.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Apr. 2, 1885.

ANTIMONY—Per pound		@	—
Hallet's		12½@	—
Cookson's		13 @	—
BORAX—Refined		7 @	8
IRON—Glengarnock ton	25 50	@	—
Eglinton, ton	23 50	@	—
American Soft, ton	27 00	@	—
Oregon Pig, tou	—	@	—
Clipper Gap, Nos. 1 & 2	26 00	@	—
Clipper G-p, Nos. 3 & 4	27 50	@	—
Clipper Gap, No. 5	26 00	@	—
Lily Lane White	26 00	@	—
Shotts, No.	26 00	@	—
STEEL—English, lb		17 @	25
Black Diamond, ordinary sizes		13 @	—
Ptow		6 @	8
Machinery		10 @	12
Sanderso 1 Bros		13 @	—
COPPER—			
Braziers' sizes		— @	25
Fire-box sheets		28 @	—
Bolt		22 @	—
Yellow Metal		14 @	15
Ingot		13 @	14
LEAD—Pig		3½@	3¾
Bar		5 @	—
Pipe		7 @	—
Sheet		8 @	—
Shot, discount 10% on 500 bag Drop, ₱ bag.	1 85	@	—
Buck, ₱ bag	2 05	@	—
Chilled, do	2 25	@	—
TINPLATE—Oldcastle	5 25	@ 6 00	
Charcoal	5 75	@ 6 75	
Coke	5 25	@ 6 50	
Roofing	6 25	@13 50	
ZINC—German		9 @	10
Sheet, 7x3 ft, 7c lb, less the cask		9 @	10
QUICKSILVER—By the flask	33 50		
Flasks, new	1 05	@	—
Flasks, old		85 @	—
NEW YORK PRICES—			
California Borax, refined		8 @	8¼
Pig Iron, American No. 1	17 50	@18 50	
Quicksilver		45½@	—
Lead	3 70	@	—
Copper		10½@	11
Tin		17½@	—
Bar Silver	1 06½	@	—

Mining Share Market.

Hale and Norcross continues the central point of interest among stock dealers, most other stocks being neglected. The vein or body of ore developed on the 2900 level by cross-cut No. 3 shows fully 30 feet in width, and the face of the drift continues in it, with no west wall as yet, although it cannot be very far off. It is not all high-grade ore by any means, although containing frequent bunches and streaks of rich sulphuret ore assaying high up in the hundreds, but frequent tests have established the conclusion that the whole will average well under the stamps, as a milling proposition. The Virginia *Enterprise* says: The three cross-cuts west from the 3020 level lateral drift, which will be driven simultaneously into the vein, will be watched with intense interest, for upon these deep ore developments depends the future status and financial bottom, so to speak, of not only the Hale and Norcross, but of the deep workings of the whole Comstock. This Hale and Norcross development may be considered as a most excellent prospect, which bids fair to culminate in a rich bonanza. If it does, it will encourage the resumption of deep operations all along the lode where they have been abandoned, but if it proves to be a failure, good-bye to the levels below the Sutro tunnel. Throughout the whole extent of the good old lode the existence of almost inexhaustible amount of low-grade ore have been demonstrated, and the only problem is whether it can be made to pay for extraction. At some points it undoubtedly can, and how much of the whole can be worked at a profit above the cost of extraction and milling will depend entirely upon ruling circumstances. Unless Hale and Norcross now proves and demonstrates the contrary the future of the Comstock lies above the level of the Sutro tunnel. This is the whole story in a nutshell.

Market Reports.

Lumber at Wholesale.

There is a fair trade in lumber, but no special changes in price. Quotations of cargo rates are as follows for redwood lumber, for delivery at San Francisco, Oakland, Alameda, Berkeley, Vallejo, Benicia, Port Costa, Martinez and Antioch:

ROUGH—No. 1 rough merchantable, $18; No. 2 (refuse) rough, $14; No. 1 rough hoards (specified width, 10 inches and over), $19; No. 2 (refuse) do do do, $14; No. 1 rough lumber, surface one side, $21; No. 2 (refuse) do do do $18.

PICKETS—Rough square pickets, $12; rongh pointed do, $14; fancy pointed do, $22.

HALF-INCH LUMBER—No. 1 ½-inch surfaced, board measure, $40; No. 2 do do do, $39; No. 3 do do do, $38; No. 4 (refuse) do do do, $32; No. 1 ½-inch battens, board measure, $40; No. 2 (refuse) do do do, $32; No. 1 ½-inch siding, 12 ft. and over, h m, $40; No. 2 (refuse) do do do $32; ½-inch siding, under 12 ft, $32.

RUSTIC—No. 1 Rustic, 1x10, 12 ft and over, $33; No. 2 do do do, $32; No. 3 do do do, $31; No. 4 Rustic, 1x10, $28; No. 5 (refuse) do do do, $21; No. 1 Rustic, 1x8, 12 ft and over, $31; No. 2 do do do, $30; No. 3 do do do, $29; No. 4 Rustic, 1x8, $26; No. 5 refuse) do do, $21.

CLEAR—No. 1 surfaced and rough clear, $32; No. 2 do do do, $31; No. 3 do do do, $30; No. 4 (refuse) do do do, $24; No. 1 surfaced and rough clear, 1x8 and 1x6, $30; No. 2, do do do, $29; No. 3 do do do, $28; No. 4 (refuse) do do do, $24.

[Dimensioned, Surfaced and Rough Clear (widths and lengths), 12 inches wide and over, add $1 ₱ M (on each corresponding grade) to the above list price of "Clear."]

TONGUED AND GROOVED—No. 1 T and G, 1x4, 12 feet and over, $32; No. 2 (refuse) do do do, $24; No. 1 T and G, 1x6, 12 ft and over, $30; No. 2 (refuse) do do do, $24; T and G, 1x6, 7 to 11 ft, $26; do do, under 7 ft, $23.

TONGUED, GROOVED AND BEADED—No. 1 T, G and Beaded, 1x4, 1¼x4 and 1¼x6, 12 ft and over, $32; No. 2 (refuse) do do do, $24; T, G and Beaded, 1x4, 1¼x4 and 1¼x6, 7 to 11 ft, $27; do do, under 7 ft, $22.

ROUGH CLEAR—1x6 and under in width, and under 12 ft in length, $24.

[On a credit of 60 days, or a discount at the rate of 1 per cent per month for anticipated payments, and not ess than 1 per cent per month added for extension of the same].

We quote cargo rates—Pine—Merchantable Rough, $15 ₱ M; Flooring, $24.20; Stepping, $37 ₱ M; Redwood—Merchantable Rough, $18; Surfaced, $32; Rough Clear, $32; Rustic, $33; Tongued and Grooved, $30; Tongued, Grooved and Beaded, $32.

Lumber at Retail.

Retail quotations for fir and spruce are as follows:

ROUGH MERCHANTABLE—(Ordinary sizes) to 40 feet long, per M ft, $22.50; Rough Merchantable, 1x6, Fencing, $22.-50; do do, 1x4, do, $23.50; do do, 1x3, do, $24.50; do do, 1x4, odd lengths, $22.50; do do, 1x6, do $21.50; do No. 2, all sizes, $18.50; do Selected, $26.50; do Clear, other than for T and G and Stepping, $31.

[Rough Clear for T and G and Stepping $1 ₱ M less than price of kind for which intended.]

Dressed T and G Flooring, 1x6, No. 1, vertical grain, ₱ M ft, $38.50; Dressed T and G Flooring, 1x6, No. 1, $33.-50; do do do, No. 2, $28.50; Dressed T and O Flooring, 1x3, 1x4, 1¼x4 and over, No. 1, vertical grain, $40.50; do do do, No. 1, $35.50; do do do, No. 2, $29.50; Dressed Stepping, No. 1, vertical grain, $42.50; do do do, No. 1, $37.50; do do, No. 2, $23.50.

SPRUCE—Rough Merchantable, ₱ M ft, $21.50; do Clear, $35; Clear Dressed (shelving), $40; Pickets (rough) board measure, $20.50; Furring, 1x2, per lineal ft, 1c; Laths, 1 and 1-inch, ₱ M, $3.50; 1½-inch, $4.

[N. B.—For all sizes over 14 inches, and lengths over 40 feet, extra rates].

Pine—Rough, $14.00: No. 2, $11.00; do do in lengths, $12.00; rough, 40 to 50 ft lengths, $15.00; do 50 to 60 ft, $16.00; T and G Flooring, 1x6, $25 00; do do 1¼x6, $27.00; do do 1x4, $27.00; do do No. 2, $20.00; Vertical Grain T and O Flooring, 1x6, $28.00; do do do 1¼x6, 1x4, $30.00; Stepping, $35.00; Furring, 1x2, per lineal ft, ¾c.

Redwood—Rough, $16 00; No. 2, $12.00; Surfaced, $30.00; do, 1x8, $28.00; do, 1x6, $28.00; T and G, 6 in. 12 ft and over, $28.00; do do, 7 to 11 ft, $25.00; do do, under 7 ft, $20.00; Rustic, $30.00; do No. 2, $25.00; T and G Beaded, 12 ft and over, $30.00; do do, 7 to 11 ft, $25.00; do do, under 7 ft, $20.00; Siding, ¼ in, $22 50; Picket, fancy, $25.00; do, rough pointed, $15.00; do. do, square, $14.00; Battens, ¼x3 in, per lineal ft, 3 c.; Shingles, $2.00; Laths, 1¼, $3 25; do 1½, $3.75; Dunnage Boards, less 5 per cent, delivered, $16.00.

Nails.

We give the price list of the Pacific Iron and Nail Company.

FENCE AND BRAD.—10d to 60d, $2.90: 8d and 9d, $3.00 6d and 7d, $3.25 4d and 5d, $3.50; 3d, $4.25; 2d, $5.50

BARRELS.—¾ inch, $6.75; ⅝ inch, $6.75; 1 inch, $5.25; 1¼ inch, $4.50; 1½ inch, $4.25; 1⅝ inch, $3.75; 1¾ inch, $3.50.

LINING.—½ inch, $7.25; ¾ inch, $8.75.

TOBACCO.—10d, $3.25 8d, $3.50; 6d to 7d, $3.75.

CLINCH.—6d to 30d, $4.50.

SLATING.—5d, $3.75; 4d, $3.75; 3d, $4.50; 2d, $5.75.

FIRSTRUNO.—2d, 1 inch, $3.75; 3d, 1¼ inch, 6c.75; 4d, 1¼ to 1⅜ inch, $4.50; 6d, 2 inch, $4.25; 8d, 2½ inch, $4.00; 10d, 1 inch and over, $3.75.

CASING AND BOX.—10d to 30d, $3.50; 8d, $3.75; 6d, $3.00; 4d, $4.25; 3d, $5.25.

FINE BLUED.—4d, $4.50; 3d, $5.75; 2d, $6.50

CUT SPIKES.—All sizes, $3.00

BOAT SPIKES.—All sizes, $3.50.

Each half keg 10 cents extra.

TERMS.—Note or acceptance at 60 days with current rate of Exchange on S. F., or a discount of 2 per cent for cash, if remitted within 10 days from date of invoice.

All accounts when due subject to sight draft without notice.

An abatement of 10 cents per keg will he allowed upon orders of 200 kegs or over.

Building Material.

Lime, per harrel, $1.50@$1.00. Plaster, $2.75-3.00. Eastern Plaster, $3.00-3.25. Rosendale Cement, $2.25-2.75. Portland Cement, $3.50-3.75. Fire Brick, per 1,000, $40 @ $45, according to brand; hard, $10.00@$12,00; red, $8.00@$8.50; soft, $7.50; face, $30.00.

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R. N. VAN BRUNT, Secretary.

DIVIDEND NOTICE.

Plymouth Consolidated Gold Mining Co.—23 Nassau Street, New York, March 26, 1885.

DIVIDEND NO. 23.—The twenty-third consecutive monthly dividend of Fifty Thousand Dollars, being One per cent on the capital stock, or Fifty Cents per share, will be paid on the sixth day of April, at the Company's offices in New York and San Francisco. Books close on the 4th. W. VAN NORDEN, President.

REMOVAL NOTICE.

Notice is hereby given that the principal office of the EUREKA GAS CO. has been removed from the city and county of San Francisco, Cal., to the city of Eureka, Humboldt Co., Cal.

C. S. BACHELDER, Secretary.

San Francisco, March 27, 1885.

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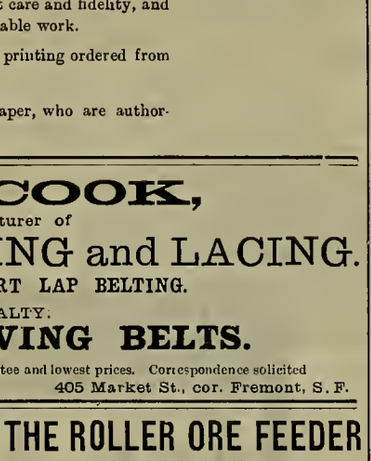

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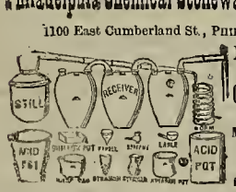

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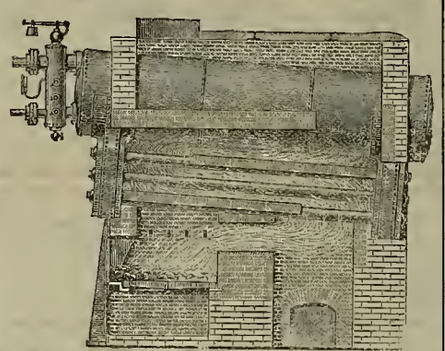

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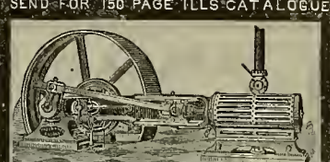

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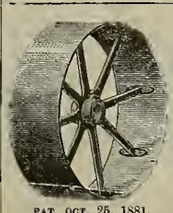

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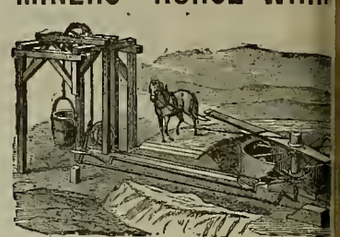

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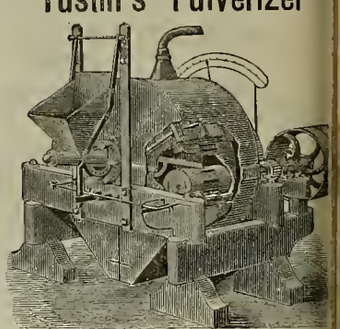

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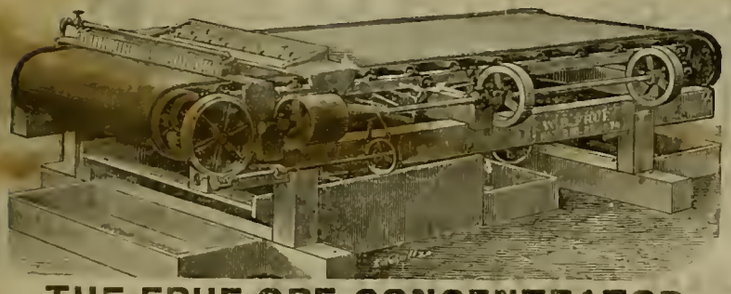

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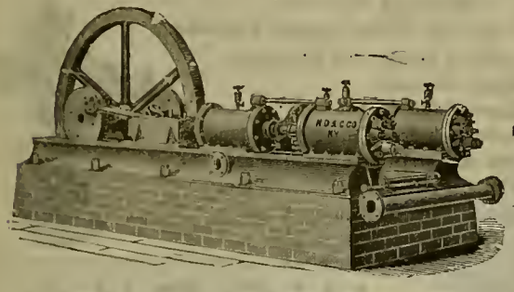

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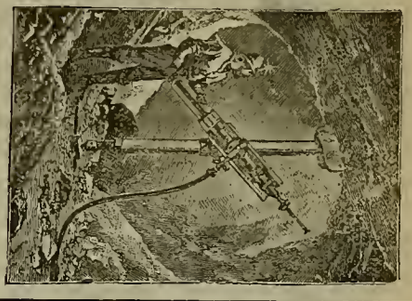

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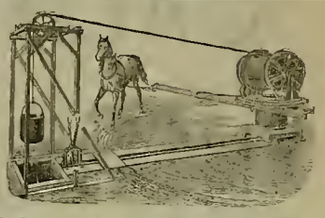

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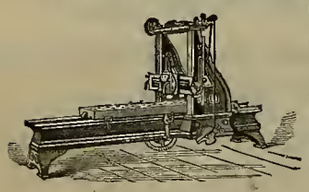

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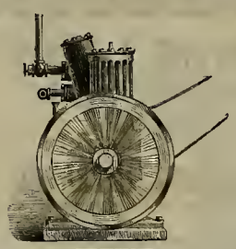

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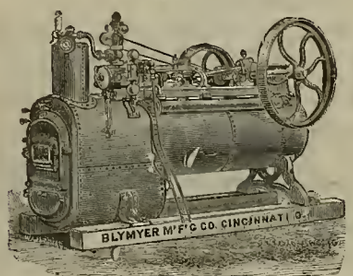

Each engine is fitted with a governor, steam and water gauges, heater, flue brush, waste and blow-off cocks, brass whistle, smoke stack with spark arrester, oil cups, gauge cocks, combination check and stop valve, and pump.

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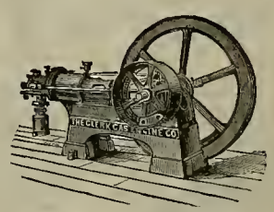

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, APRIL 11, 1885.

VOLUME XLXX
Number 15.

The New American Turbine.

The accompanying cuts illustrate the New American Turbine water-wheel as now constructed. The wheel was originally made with steel buckets set into the mold and the iron run on to them. This make of wheel proved to be lacking in strength for high heads, and that mode of construction was abandoned. They are now making them in one solid casting, or in one continuous casting, in dry sand molds, the result of which is perfect wheels with even, true, smooth surface, and wheels of unquestioned strength, producing high percentage of power at whole or part gates, or part water; also wheels of great power for the diameter. These wheels are made to stand the pressure of very high heads, and at the same time produce a high percentage of power from the amount of water employed either at whole or part gates.

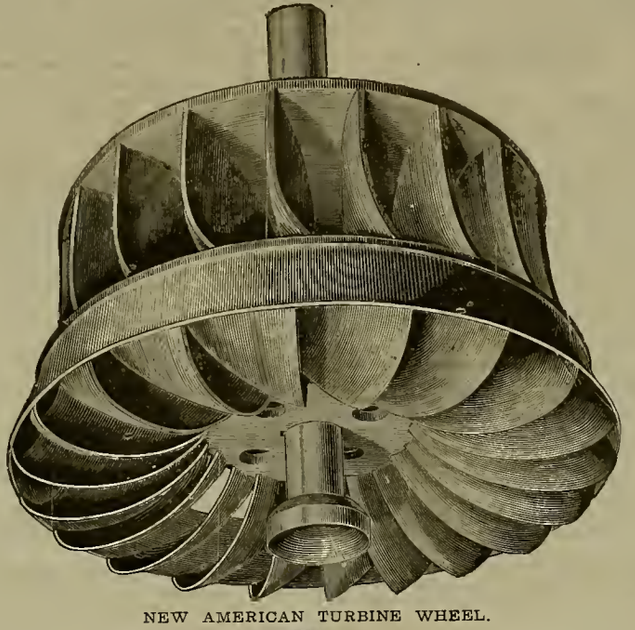
The wheel-case used in the construction of the New American is the same in its general mechanical arrangement as used on the well-known American wheel, although in a greatly improved form. An entire new line of case-patterns have been made for all sizes, and greatly strengthened. More than 2,500 lbs. have been added to the 66-inch case alone, while the wheel and case of this size complete weighs over 9½ tons. The improvement of case has been such as to be the subject of a patent. They claim that in the construction of the case with the graduated chutes they have the best application of water ever made to turbine wheels.

The gates can be operated under any head with a governor, and a perfectly steady motion given to the machinery.

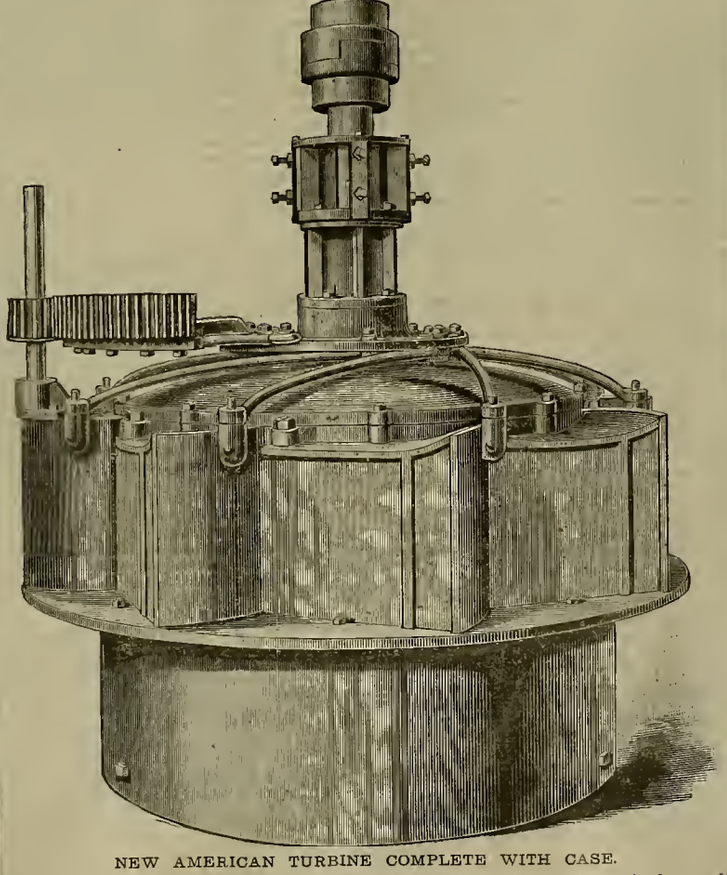
The power of these wheels to move the load at a slow motion is a valuable feature. All the machinery of a mill of 2,000 bbls. capacity, or more, can be moved so slow in starting that the motion will be scarcely perceptible, and the motion can be increased as gradually as desired, so that a belt can be put on in any part of the mill with perfect safety. These features are the same with any power and under any head. One user states that he started and stopped one of these New American Turbines eight times while the main line of the mill made one revolution with all the machinery of a 1600-bbl. mill.

This feature is due to the direct and unbroken manner in which the water is applied through the graduated chutes to the buckets of the wheels. This gradual starting cannot be done with register gate wheels. Millmen know the importance of starting up all kinds of machines gradually, and will appreciate this feature of the new turbines. It will be seen by the cuts that the new American wheel proper is of entirely new design.

Several New American Turbines have been tested at the Holyoke Testing Flume, some of which were in the competitive tests. The tests were made from full to half gates, and the manufacturers state that the New American gave higher average results than any other wheel of equal power. These wheels are made by Stout, Mills & Temple, of Dayton, Ohio, the general agent for this coast being H. H. Kryger, No. 4 California street, San Francisco. These wheels are made from 13 to 66 inches. Recently the manufacturers have built a 6-inch turbine, which will work under 3 to 100 feet head, and give from 0.26 to 50. horse power.



NEW AMERICAN TURBINE WHEEL.



NEW AMERICAN TURBINE COMPLETE WITH CASE.

THE pay rolls for March of the principal mining enterprises on the Comstock amounted to $91,246.

JUDGE ECING of Pittsburg, has decided that a store-order given by any company to an employe is illegal. The telegram does not state the grounds upon which the decision is based, but that it has been made will be a cause of congratulation to many miners.

THE new reduction works built by the Paradise Valley M. & M. Co., are said to be running splendidly. Should the works do as well as the company anticipates it is likely that very many more stamp mills will be built in that part of Nevada.

Exhibition of "Works and Labor."

In July of this year an exposition will be opened in the Palace of Industry, Paris, which will consist of an exhibition of "works and labor." It is placed under the immediate patronage of three French ministers, those of Commerce, Public Instruction and Public Works, who propose exhibiting the material of the various branches of instruction belonging to each of their departments, and as the Palace of Industry will be transformed into a bonded warehouse in order to afford a free entry to all goods sent, foreigners are invited to take part in the competition. A department for each of the following countries has already been opened: Great Britain, Belgium, Italy and Austria-Hungary.

Leon Chatteau, who was in California not long since, is general commissioner for the American section, and writes to the Mayor of San Francisco asking our people to contribute. Many interesting machines almost unknown in France might certainly be sent over for exhibition to the advantage of the American builders, who would thus find new purchases or new fields for the sale of their products. Mr. Chatteau says: "We are, moreover, convinced that models and furniture of school buildings, apparatus and instruments for facilitating instruction, the magnificent machinery used by your unparalleled fire brigades, the reproduction of municipal works, such as the service of drains and sewers, railways, canals, mines, forests, telegraphs, telephones, the military services, such as ambulances, etc., setting forth the progress made through your municipality, would prove of the highest interest and instructions for this country and the nations who have decided to come forward and compete with us in the month of July next. We shall reserve all the space that you may need in one of the best parts of the building."

Steel for Mine Timbering.

The cheapening of the cost of steel has been the cause of bringing it into use in many new channels where previously it had not been thought possible. A company in England is now making a new departure in mining operations by manufacturing rolled steel baulks and pit props as substitutes for wooded beams and props for mining purposes. Owing no doubt to the confidence which engineers can now place in this material, and also to the low price at which it can at present be purchased steel is now being used for many purposes for which a few years ago it would have been hopeless to try to introduce it. As regards its use for mining purposes, it is advocated that greater strength can be obtained, and less space taken up than with the ordinary wooden beams, and that when the life of steel as against wood is taken into consideration steel has also the advantage in the matter of ultimate cost. Rolled steel baulks and props are already finding considerable favor amongst the collieries in the Midland district, where they are being used, and they will also shortly be tried in the Cleveland mines.

Old railroad iron has been utilized to some extent in a few instances for such purposes, but its use was necessarily limited. The light steel will take up little space, and where it can be made cheap, as compared with timber, will no doubt come into greater use than heretofore, for the reasons given.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

The Mineral Belt of Amador County.

EDITORS PRESS:—Although it is early in the season for mines to commence working, it is nevertheless true that here in this southern end of the "mineral belt of Amador county," California, the echoes of the minsr's blast, with the pounding of the stamp mills of quartz, resound from hill to hill now daily, and have been doing so for some time; whereas only one year ago there was not a stamp quartz mill near this locality in operation. To-day no less than four different quartz mills are pounding away on gold quartz rock from as many different quartz mines here. Less than two years ago this month I was down here with Dr. Chambers, who then came here and located the ranch that now is his home; then all was a "wild wilderness" hereabouts, and people thought and said that he was out of the world nearly. To-day I eat dinner at Belle Monte cottage, upon the ranch of the doctor, and what do I find but a pleasant and comfortable home and an orchard of 500 young, choice fruit trees, 2,000 choice foreign grape vines growing here, and a number of his fruit trees are now in blossom and will bear fruit this year. There is a beautiful grove of evergreen and other shade and ornamental trees of five acres around the house, with fields cleared and fenced, making this a most desirable place and home—on the main traveled road to the Nevills or Mammoth quartz mine, only five minutes' walk from his residence, with one of the finest climates in all California. One year ago no road was near here. The Amador Canal Ditch is also surveyed and built to near the doctor's house, with a reservoir for holding water for the mines.

At the St. Julian mine, with its stamp mill, there is a good dwelling and boarding-house, and blacksmith shop, which was built at this mine a month ago. The mine is being worked night and day, with good-paying results; and the quartz mill at the Nevills mine is also pounding away daily upon rich ore. The two tunnels are being worked and pushed night and day, some 40 men being employed here. The Valparaiso mine is being worked night and day, also. A large dwelling and boarding-house, and blacksmith shop and other buildings were put up here only a month and a half ago. A 1200-foot tunnel is being run which will ere long find good, rich ore, when a quartz mill will be erected here. The 20-stamp mill at the Kelley mine is not very far off. The quartz mill at the Amador quartz mine, with an additional 20-stamp mill now building, is only 30 minutes' walk from the same point as all the other mills, and less than two miles off is the Moore mine and quartz mill that will start up as soon as the engine and hoisting works are ready, the engine now being on the ground. It will be seen that no less than six different quartz mills and mines will be working and running within one mile of Belle Monte ranch, or the Nevills mine, and with parties that would take hold of the Mammoth No. 2 mine that joins the rich Nevills mine, and open it up by sinking one or two shafts, 100 or 200 feet each, there doubtless would be added to these six mines and quartz mills another mine with a quartz mill. The Nevills, or Mammoth, mine, of Senator John P. Jones and others, ranks second to no gold mine on the Pacific Coast. To recapitulate and contrast this spot or place, where one and a half years ago Dr. Chambers built his home, and now resides here at Belle Monte ranch, will show you the great change made here in that short time, viz.: Eighteen months ago no mine or quartz mill was running or being worked, (except the Nevills, which was just starting up about that time) and to-day five or six mines and quartz mills are running and stamping out the gold, all within hearing of Belle Monte ranch and within about one mile in distance from this place. So much for the boom or impetus given to gold quartz mining between Jackson and near Middle Bar, on this "mineral belt of little Amador county," California. Rumor says that Governor Leland Stanford is going to take hold of the some of the mines in this vicinity, which it is to be hoped will prove true, as he is one of the best business men in the United States to-day.

WELLINGTON.

Sweetwater.

EDITORS PRESS:—There is considerable work going on all over this camp for this time of the year. We all know that this camp will have to come out on its own merits, there being no railroad or other transportation companies to help boom it. The present heavy discount on silver is a great drawback on mining; besides there are but a few farsighted mining men who invest in silver mines at present. They look up the best mines and get in at their new figures. They are very likely to come out on top of the pile, especially should Germany remonetize silver. Even at the present heavy discount, there are several mines here that pay well. The oldest and best prospectors have the greatest faith in the place. One of them, a good business man, and who might make lots of money in almost any place, has such faith in the camp that he digs away every day, and has been doing so for the past four years, and will do so for four more rather than weaken. Hundreds of others are just as determined.

The immediate prospect for early spring is a new mill in Sweetwater canyon (10 to 20 stamp), with water and steam power, so as to work the year round; when the water freezes it will be able to work low grade ore.

The Lookout Co. cut the lode 70 feet from the mouth of the new tunnel, where it is three and a half feet wide. In a few feet it widened to seven feet, and is still widening. The ore is a good milling proposition. They are not far from the point where they had an ore body of 300 feet on the surface which went up in the hundreds. The new owners feel very gratified over the prospect. They will put on additional force shortly.

The Kentuck have two and a half feet of ledge in the face of tunnel No. 2.

A local mining man of experience and means, is trying to get the control of the Homestake mine, Silverado canyon. There are some eight or ten owners of the mine at present.

The Comstock, a large and good mine, south of Sweetwater canyon, is said to be as good as sold to a rich company.

R. T. S.

California's Exhibit.

It is probable that the people, the products and the material developments of the grand Golden State excite more interest in the extreme South than in any other portion of this republic. The Crescent City has made an earnest attempt to acquire a fair portion, at least, of the grain shipping traffic of that great Western cereal producing region. The numerous studs of this city groan under a weight of exquisite California fruit, while every steamer that leaves this port for the West India islands, and for the extended coast of Central America, carries among its cargo boxes of California apples, grapes and pears. This traffic, which is now in its infancy, is gradually increasing, and we venture to predict that the time is not far distant when the countries that bask under the benign influence of the Southern Cross will receive the greater portion of the temperate fruits demanded by their markets, from California "via" the Crescent City.

The California exhibit, at the Government Building, is a complete study in itself, and requires several days to examine it thoroughly. The Southern spectator cannot refrain from acknowledging that the products from the progressive State are all of an exaggerated type. Its gold mines are still the richest that have as yet been discovered on the planet. Its fruits are the largest and best flavored produced anywhere. Its peaches, pears and grapes, in particular, possess a savor that cannot be excelled, while the vines of Alameda and Los Angeles produce a wine that to-day, in the opinion of many, ranks equal to any made on the famous soil of Champagne, the classic banks of the Rhine, the sunny mountain slopes of Italy, or the fertile hillsides of Sicily.

The South boasts its extended regions where a favorable climate and surroundings produce grand forests of cypresses, whose giant branches are festooned with the funereal drapery of Southern moss, but our largest trees are mere dwarfs in comparison with huge California cedars which grace the Humboldt region and the valley of the Yosemite. In fact everything, whether fruits, cereals, vegetables, trees or flowers, are of an exaggerated growth, while an examination of the flora of the State almost carries one back to the carboniferous period when the properties of the atmosphere were the most conducive to the production of the grand types of vegetation.

To the right of commissioner's headquarters is situated the mineral display, under charge of Prof. Hanks, of the State Mineralogical Bureau. This, for variety and value of specimens, if not the largest, is probably one of the most complete precious metal-bearing mineral exhibitions collected. Great care has been evinced in selections made for the display; thus our Southern people who have heard so much of the vast mineral wealth of that sister State may, from an examination of this department, form a faint idea of its actual value.

Meanwhile the people of this section claim, *with pride*, that Southern enterprise and Southern energy was partly instrumental in developing the grand agricultural, forest and mineral resources of this unique region, while the American people who recollect that the Spanish Jesuit fathers knew of the existence of placer gold mines, in different localities, and who, regaled on the glorious grapes of Los Angeles, in vain called the attention of their countrymen to the natural resources of the country, can justly boast that American enterprise and energy alone has developed its wonderful riches, and has transformed this vast Western wilderness into a blooming garden.—*New Orleans Times-Democrat.*

FIVE thousand feet of large hydraulic pipe is being riveted and put in order for the Virginia Creek Hydraulic Company. The mines will be extensively worked this season—judging from the preparations made—*Bodie Free Press.*

The New River Region.

From an extended article in the Trinity journal, the editor of which paper recently visited the New River mines, we make the following extracts.

White Rock is located about one and one-half miles below the summit of the Salmon divide, which is the northern boundary of Trinity county. It contains a hotel, one store in full operation, one just erected and another in process of erection, blacksmith-shop, stable and a number of cabins. Many lots have been sold and staked off, and additional buildings are going up as fast as lumber can be obtained. Marysville at present has a store, hotel, stable, and several cabins; other buildings in process of erection. It is about one-half mile below White Rock. New River city is located on a flat two miles below Marysville and bids fair to be the largest town of the three from the fact that it has more room to spread. The townsite contains 40 acres which has been surveyed and laid out in streets and blocks. Land is considered scarce and the streets are to be only 50 feet wide—too narrow, as the first fire will surely prove. Here is located the saw-mill of Yocum & Co., which is in full blast and has orders two or three months ahead. The New River Development Company will at once erect a large hotel at this point and special inducements will be held out to have business men settle there. It has the other advantage of being below the mines, and men would always rather walk down hill than up after a day's work All the towns are bound to thrive for a long time.

Routes of Travel.

There can be no doubt but that several thousand men will visit the New River mines during the present spring and coming summer, and to these the question as to which is the best route is one of much importance. A great deal has been printed and written in support of each of the several roads by which the mines may be reached, and while we have ever been honest in the belief that the route *via* Weaverville was the shortest, quickest and cheapest, we are more than ever convinced of the correctness of this view since going over the line. Leaving White Rock at 7:30 on Thursday morning and laying off two hours to allow animals to feed, Rattlesnake was reached at 4 in the afternoon, the actual traveling time being six and one-half hours and the distance not to exceed 17 miles; this over a somewhat circuitous route with much more up-hill and down-hill travel than is at all necessary.

A knowledge of the country leads to the belief that a good graded trail can be made from the mouth of Rattlesnake creek to White Rock in a distance of less than 15 miles—possibly not more than 12 miles. Leaving Rattlesnake at 6:45 Friday morning, North Fork was reached a few minutes before noon; two hours were spent there, another hour at Junction City, and Weaverville was reached a little after 6 o'clock in the evening. The distances from Weaverville are as follows: Wagon road to North Fork, 15 miles; splendid trail, traveled for many years, to mouth of Rattlesnake, 20 miles; new trail to be built at once to White Rock, 15 miles; total distance from Weaverville to New River mines, 50 miles—and no further. As to cost, taking San Francisco as the initial point, the fare is as follows:

To Redding by rail	$9 05
" Weaverville, stage	7 50
" North Fork, wagon	2 00
" White Rock, saddle	10 00
Total fare	$28 55

We have no word of condemnation regarding other routes to the mines. Eureka and Etna each have fair trails. Many Humboldt people are interested in the District, much of its business is in their hands, and as they go only to Eureka that will be their route. Siskiyou county will undoubtedly supply the district with flour, cured meats, feed and many vegetables, and a direct road to this promising market was a necessity which they were quick to see. But when it comes to a road for general travel, neither of the others can compete with the Weaverville route and their strongest advocates cannot truly claim otherwise if once acquainted with the "lay of the land." This is the natural outlet, and should the mines prove sufficient to justify the building of a wagon road for the transportation of machinery and other freight, it must be built by the way of Weaverville. No other is practicable. This is neither blow nor bluster; it is the cold, clean fact.

New Trail at Once.

Recognizing the importance of immediate action in the matter of building a good graded trail from Rattlesnake to the mines, the editor of the *Journal*, in company with Messrs. Jacob Paulsen and C. W. White, canvassed Weaverville last Monday morning, and in an hour's time succeeded in raising by subscription $512.50 for the purpose named. This amount has since been raised to $630, and will be further increased by other donations here, at Junction City, North Fork and other points until the amount reaches $800, or even more. This will build the 12 or 15 miles of trail needed to make the through connection, on an easy grade and in splendid shape, and will place Weaverville within one day's travel of the New River mines. The trail will be built without delay, and when completed lower rates of fare may be expected from Redding to the mines. When the advantages of this route are understood, it is certain that the great bulk of general passenger travel must come this way.

Since the above was in type, several of our prominent citizens, having a direct interest in travel to New River, have canvassed it thoroughly and agreed to place matter of building the trail in the hands of Mr. James Mullane. Work will commence next week, and rushed to completion. By the middle of April, or possibly a few days later, a good trail on a wagon-road grade will be put through to the New River mines. In the meantime, we can assure travelers that there is now no difficulty in reaching the mines from Weaverville, and that the trip can easily be made from this place.

Pocket Mining in Tuolumne.

Pocket mining is practiced here with varying success. Ever since the unearthing of the Divoll pocket in the Bonanza mine, situated in the town of Sonora, pocket mining has been prosecuted with untiring zeal by many who were anxious to take the rapid road to wealth and amass a fortune in a moment, as did Mr. Divoll and his three lucky partners. This kind of mining is peculiar in many respects. In the first place, a man must be to a certain extent adapted to it; in fact, pocket miners are born, not made; second, he must have patience and perseverance, and third, he must have a grub stake to begin on. Indications of a pocket are sometimes favorable for a long time before the pocket is a reality, and in many instances the prospector finds the bottom of his own pockets before he finds his ore pocket indications, or before his indications turn to a reality. The Divoll pocket was, perhaps, the largest ever found in the State, and made the three finders independently rich. After taking out a large amount the party ceased operations for a time, but about six months ago commenced running a tunnel to drain the mine. The tunnel will also be used as a tramway. It is the intention of the company to sink the shaft to a greater depth in anticipation of finding another pocket. When Divoll & Co. made their lucky strike a few years ago, others were led to explore the recesses of the earth for more hidden treasures, and an impetus was given to pocket mining, which has not abated, although many have been compelled, through adversity, to desist for a time, only to renew their efforts when they had acquired funds through other channels. In this way several pockets have been taken out quite recently. The largest one fell to the lot of David Oliver and Michael Shine, who, it is said, took out $36,000, one chunk weighing ten pounds. Another pocket was discovered by a party of Austrians not long ago, the full value of which is not yet known, owing to the fact that the discoverers have not taken out all they have in sight. Several small pockets, ranging in value from $100 to $1,500, have also been discovered.

In most cases the prospectors do not own the mines themselves, but lease the right to mine on the land, most of which is patented for agriculture or is in private hands.

This Summer's Water Outlook.

Owing to the scarcity of rain this winter, the coming summer's outlook for water for milling purposes is not at all favorable. The scarcity of rain has caused the water to fail in the streams at least six weeks' earlier than usual, and unless there is a good supply of rain this spring the water will be exceedingly short before the last of May. There is very little snow in the mountains.—*Cor. Bulletin.*

The "Novelties" Exhibition.

The announcement of the managers of the Franklin Institute of their intention to hold another exhibition in Philadelphia during the autumn of the present year will be news of interest to all our readers. The Electrical Exhibition of last year was an unqualified success in every way, and was most creditable to this useful and venerable institution, and to all who were concerned in it.

The managers have decided this year to hold an exhibition of a more popular character. It will be known as the "Novelties" Exhibition, and will be devoted, as its title indicates, to the display of such recent inventions, improvements and discoveries in the arts and manufactures, as may be deemed worthy of admission.

It will afford our inventors and manufacturers an excellent opportunity of bringing to public notice their best and most recent achievements. That the character of the forthcoming event will undoubtedly be maintained up to the highest standard of excellence goes without saying, and our people may look forward to the "Novelties" as a rare source of interest and instruction.

From the announcement of the managers, the "Novelties" exhibition will be opened on Tuesday, September 15th, and will be closed on Saturday, October 31st.

THE trustees of the eleventh provision of the Lick Trust have paid $35,000 for a site for the free public baths, on the northwest corner of Tenth and Howard streets, 250x125 feet in extent. The trustees intend to push the construction of the baths to a speedy finish.

MECHANICAL PROGRESS.

The Rising of Steel During Rolling.

It has been repeatedly observed that rolled-steel ingots rise more or lose in the reheating furnace, making the continuance of the rolling impossible. In other cases this rising happens only in the finishing rolling. Dr. F. C. G. Mueller, Brandenburg, Germany, has had occasion recently to study this phenomenon more closely, and reports the results of his observations in *Stahl und Eisen*. At one of the German basic steel works a 1200-pound ingot of the ordinary section was broken down previous to rolling into an eye-beam. When it was put back into the reheating furnace it began to rise over half its length, and was taken out and put aside. Later it was drilled into under water, the gas inclosed in the cavities, contrary to all expectations, showing no pressure. It was analyzed by Dr. Mueller, and found to contain:

	Per cent.
Hydrogen	43.0
Nitrogen	28.5
Carbonic oxide	27.2
Carbonic acid	1.6
Oxygen	
Total	100.3

Later the ingot was sawn in two at the point where the steel had swelled most. Dr. Mueller gives a fac simile of the section of the swelled ingot, showing clearly two enormous cavities grouped symmetrically around a central core of sound metal, and connected in their upper part by a narrow channel. The two corresponding sides of the ingot had strongly bulged, and the concave form of the other two, with the four corners of the ingot sharply twisted, clearly illustrate how powerful the gas pressure must have been. Dr. Mueller attempts to explain this phenomenon in the following manner: All Bessemer steel, and particularly basic steel, contains many times its volume of inter-molecular gas. Although this gas has a tendency to escape, the cohesion of the metal does not allow it. It is a different thing with unsound ingots, and the particular form of porous ingot is that where lies between the sound core and the sound shell a layer containing a large number of blow-holes. When such an ingot is being broken down, the mechanical action of rolling tends to crush this layer or zone, and the outer shell separates from the core. During reheating the compressed gas succeeds in bending the shell outward, and causes the swelling or bulging. The absence of pressure of gas in the cavity when drilled into is remarkable in the face of all evidences of high pressure. Dr. Mueller believes that the gas must have escaped in the furnace, and that during the heating of the ingot a part of the gas must have diffused through the walls of the cavity. Since hydrogen diffuses most readily, the comparatively low percentage of that element in the gas analyzed is explained. He attributes the swelling of steel in the rolls in rolling sheets to the same causes. In an ingot with an unsound core while it is being rolled down there is too much thickness of metal to allow the gas to escape. But, as the sheet grows thinner, the resistance to the expansion of the gas becomes less, and it finally causes the sheet to swell. Dr. Mueller quotes an instance in which this occurred at the seventh pass in the sheet mill, breaking a weak roll. In rail mills blisters are often noticed appearing on the web of the rail. All these phenomena Dr. Mueller attributes to the one general cause—the pressure of gas originally in the ingot in casting.

How to Balance Planer Knives.

An experienced mechanic gives the following instructions concerning the balance of knives: All prominent knife manufacturers understand the importance of having each of the two, three or four knives of a set exactly the same length, width and thickness, and if made properly they will weigh the same. Now to be in balance they must be kept so by grinding the bevel. Do not chip off the heel or chip out the slot to make them weigh alike, for they will not be a running balance. If you should get a nick broken out of one of your knives, set that knife back the least trifle and it will not show on the board, or grind them all down alike on the bevel. A short time ago we were called to see what was the matter with a planer which the parties claimed would not do good work. The planer was new, had been in use but a few months, and a fine machine. We threw off the cylinder belts and examined the head, a three-side; it was loose in the boxes. On examining the knives we found two of them with notches slipped between the slots on the heel. It seems they had broken a notch out of one knife and ground it out, and chipped notches in the heels of the two to make them weigh alike. It would simply be impossible to do good work with a machine in this condition.

THE IRON INTEREST IN ENGLAND.—The English correspondent of the *American Manufacturer*, of a late date, says: The rails which the country sent away to export customers last month were of the value of £153,631, whereas the value of those exported in January last year was £213,202. Seven markets have not taken a single rail. These are Russia, Sweden and Norway, Germany, Holland, Spain and the Canaries, Italy and Egypt. The increasing markets are Chili, Peru and British North America. All others have fallen off very seriously. The United States and Mexico show worst of all. The anomaly in the iron business which all ironmasters feel is the high wages which the organizations of millmen are able to enforce. The rates of payment are far higher than they ought to be, considering the work that is done by the recipients and the profits of the masters. Yet the millmen's organizations are showing renewed life, and whether in Staffordshire or the North of England, attempts to reduce the present high scale threaten to be attended with much difficulty in localities where the works are numerous. A less unyielding spirit is being shown where the works are few. The 150 hands employed by the Newton Iron Works, Staffordshire, have consented to slightly reduce wages, and their employers have decided to again start the works which they had closed for a short time.

IMPROPER LOCATION OF THE BOILER FEED.—The evil results likely to arise from the improper location of the feed, or rather, perhaps, we should say the delivery of the feed water into a boiler at the wrong place, are more serious in their character and greater in extent than is generally known. It is no unusual thing, in fact, we might almost say that, as a rule, if plain cylinder boilers are fed with cold water through the bottom of the shell, and no provision is made to allow of its thorough incorporation with the water already in the boiler, and assuming the temperature due to the steam pressure, before coming in contact with the bottom plates of the boiler over the fire, these plates will crack through the girth seams, and the owner is fortunate if the boilers do not explode. The force of contraction under such circumstances is irresistible. It is very bad practice to put up cylinder boilers and introduce the feed through the mud drum. It should enter the boiler and be delivered just below the water line. By this means it mixes with and attains a high temperature before it comes in contact with the shell plates, and much trouble is avoided.—*The Locomotive.*

GRAPHITE AS A LUBRICANT.—The use of graphite, sometimes styled plumbago or black-lead, is becoming greatly extended as a lubricant, for the lessening of friction and heating of journals. For this purpose it is growing rapidly in favor. For lubricating purposes none but the very best plumbago will answer. It must be pure and free from grit. This purity is attained, not by bolting it, but by floating the plumbago in either air or water. The water method is simplest, and during this process it is treated with a bath of dilute sulphuric acid which takes up the particles of spar and iron, leaving the sulphates of lime, magnesia and iron easily washed out. For metal bearings the plumbago should be used with oil, but for wood bearings, after a few applications of oil and plumbago, the oil may be dispensed with, and the dry powder only used. On hot axles or journals it should be applied freely dry, then oil up as usual. Although plumbago was used for this purpose more than 200 years ago, the true method of preparing it was not known until within a few years, so that it comes before the public almost as a new material.

DIVISION OF POWER.—The old-time notion of one immense central engine to furnish power for an entire large establishment is getting out of date. The change is to independent engines for each department, so that one may be stopped for repairs, or from slackness of work, while another may be run without carrying the load of the connecting shaft and pulleys. This is true economy, for sometimes the requirements of a really large establishment may be met by the power of a small engine—perhaps twenty horse power serving for an establishment that requires in its entirety not less than one hundred and fifty horse power. It is best, also, that the steam should be furnished by independent boilers, and not from one battery of central boilers. In short, the change demands, for convenience and economy, the existence of separate engine and boiler plant for each department, the whole to be connected if required.

STEEL INSTEAD OF IRON FOR CARD TEETH.—The manner in which steel is taking the place of iron in all directions is further illustrated by the use of hardened and tempered steel wire upon cards for cotton and wool. The average life of a suit of card-clothing upon cotton is six years, and upon wool considerably less than that. The use of steel wire in place of iron has not been tested long enough to determine its comparative durability; but it is claimed to do better work, and to require less frequent grinding, and hence textile manufacturers are willing to pay the increased cost, amounting to from 50 to 100 per cent above that of the common iron-wire clothing.

THE FONTAINE LOCOMOTIVE.—The Fontaine locomotive, which won peculiar celebrity some time ago on the line of the Canada Southern, has finally disappeared. The central idea was the introduction of two friction wheels above two driving wheels. By the contact of the upper wheel with the lower a greater number of revolutions per minute, and hence greater speed, could be obtained. A company was formed with $1,000,000 nominal capital stock at $25 per share. Two engines were built at an expense of $25,000, but they proved failures. Altogether the company paid out $645,000 and received $2,700 in return.

SCIENTIFIC PROGRESS.

Why the Wind Changes.

A careful scientific study into the causes operating to produce the varying changes of the wind is of much practical importance. A late writer in *Cassell's* magazine says that the changing of the direction of the wind is due to the shifting of the situations of the greatest heat upon the earth is substantially proved by the fact that in certain regions of the earth's surface, where the situations of the greatest heat and cold do not alter the direction in which they lie to each other, the wind does not change, but always blows in the same direction from one day to another, and all the year round. This occurs in the great open space of the ocean, where there is no land to get heated up by the sunshine of the day, and to get cool by the scattering of the heat at night. In those spaces, for a vast breadth of many hundred miles, the sun shines down day after day upon the surface of the sea, heating the water most along the mid-ocean track, which lies immediately beneath its burning rays as it passes across from east to west.

This midway track of the strongest sunshine crosses the wide ocean as a belt or zone that spreads some way to either side of the equator. Throughout this midway track the cooler and heavier air on either hand drifts in from the north and from the south, and then rises up, as it becomes heated by the sun, where the two currents meet. In both instances, however, in consequence of the spinning round of the earth, the advancing wind acquires a westward as well as an equatorial zone, where the onward movement of the sea-covered surface of the earth is performed with the velocity of a thousand miles an hour, does not immediately acquire this full rate of speed, and lags back upon the ocean, so that it appears as adrift toward the west as well as toward the equator.

On the north side of the equator the wind blows all the year round from the northeast and on the south side from the southeast, both in the Atlantic and Pacific Oceans. These steady and unchanging ocean winds are called the trade winds, on account of the great service they render to ships carrying merchandise across these portions of the sea. In sailing from England to the Cape of Good Hope, through the entire length of the Atlantic Ocean, ships, before they reach the equator, have to pass over a broad space, where the strong winds are always steadily blowing from the northeast. That is the region of the northeast trades. They then traverse a space near to the equator itself, where the northeast wind ceases to blow, and where the air is very still and calm, and they afterward come to a region south of the equator, where south winds are continually blowing from southeast. That is the region of the southeast trades.

SMALL STORAGE BATTERIES.—A New York company is now manufacturing practical electrical storage batteries of various sizes and prices. The smallest size made, which costs five dollars, is about as large as a powder flask, and weighs half a pound. Its power, when charged, is sufficient to run a four-candle lamp for four hours. To recharge costs twelve cents. Its chief use will be for the lighting of very small lamps, the smallest about the size of a bean or the head of a shawl pin; such lamps are used by surgeons for examinations. The next size of battery is in the shape of a cube about six inches square, and weighs two pounds. Such a battery, costing $12, will feed a desk lamp for ten hours at a cost of about twenty-four cents for charging. The next size of battery, 12 inches by 16 by 9, is intended for carriages, and will give current enough for two outside lamps and one inside for four hours a day for ten days; the cost of recharging will be thirty cents. For running sewing-machines a battery is made measuring sixteen inches each way and weighing twenty pounds. It will run a sewing-machine for a month, and cost a half-dollar to charge. All such batteries are warranted to last two years.

HEAT RAYS SEPARATED FROM LUMINOUS RAYS.—French experiments have resulted in the discovery of a method of isolating the heat rays from any source, intercepting the illuminating and chemical rays. A piece of glass has dropped upon it a drop of melted and sublimated selenium, which is immediately covered by a thin glass, and the melted material is then squeezed gently until it is extended into a very thin, homogeneous sheet. The glass is then placed under pressure and gradually cooled. It is necessary that the selenium should not boil on the glass, or, otherwise, cells are formed by means of the vapor, which interfere with the action of the material. When properly made, the cell is of uniform thickness, and free from bubbles and striations. Cells thus constructed, when placed in the path of a ray of light, reflect the chemical rays, and convert the luminous ones into electrical energy: only the calorific rays pass through the cell, being at the same time subjected to a definite refraction. The transmitted light is monochromatic, of a ruby-vermillion tint, only showing one luminous band in the spectroscope.

THE SCIENCE OF MICROBIOLOGY.—The chair of a new science has been added to the teaching machinery of the Sorbonne. France has followed the example of Germany in raising microbiology to the rank of a recognized science. The establishment over which Dr. Koch presides in Berlin is the completest and best equipped in Europe. He has four army surgeons as assistants, and some sixty or eighty students, among whom are not a few savants of standing, are daily pursuing their researches in his laboratories. Dr. Koch, who was a modest veterinary surgeon in Breslau four years ago, and who has never had a regular academical training, was looked upon with distrust and jealousy by the German universities when his studies in bacteriology brought him into prominence and won him the support of Prince Bismarck and the favors of the Government; but the opposition to his methods and theories has nearly altogether subsided, and he was named professor in the medical faculty of Berlin a fortnight ago. M. Duclos, one of the most distinguished of M. Pasteur's pupils has been appointed first professor of microbiology at the Sorbonne.

CONSTRUCTION OF OBSERVATORIES.—In the construction of buildings devoted to the purpose of astronomical observations, the most important requisite is to provide against the effects of vibration on the apparatus. Any contact with the floor or other portion of the building would not fail to produce, upon the slightest movement, concussions which, multiplied by the magnifying power would render the telescope useless. The mode of adapting the building for its peculiar use is by rendering it independent in all of its parts of the piers upon which the instruments are fixed. The foundations of the latter are also laid as deep as possible, in order to obviate the effects of vibration from external causes, against which, however, it is not always practicable to guard, the mere tread of a foot passenger being often sensible to an observer using a powerful telescope at a considerable distance.

AN ICEQUAKE.—The town of Madison, Wis., lately had a tremor which was due not to a social or other earthquake, nor yet to a dynamite explosion. A disturbance which shook the University buildings was caused by the expansion and contraction of ice in Lake Mendota. Under the influence of intense cold the ice had expanded until the shores could resist the pressure no longer, when the ice burst and doubled up about 400 feet from the shore, and ou a line parallel with it. The sudden release of the shores from pressure caused the tremor. This phenomenon of freezing upon bodies of water having low shores frequently results in the piling up of rocks on the edge and the overturning of trees. The shore line of lakes frequently consists of gravel mounds forced up during successive winters.

SECURING AN ANTARCTIC DISCOVERY.—The Hartford *Times* tells the following: Capt. Nathaniel Palmer of Stonington, the original discoverer of Palmer's land, farthest south of all known land, tells the following way he saved the discovery. He was getting ready to leave it when a Russian frigate hove in sight. Capt. Palmer was ambitious to secure the land for the United States. How to contend with the ship of the Czar he did not know at first. He waited till the frigate ran to the leeward of him and hove to, and then he put up his sheet and squared away for her, running under her stern and calling out as he shot past: "Ahoy, there! ship ahoy! do you want a pilot in?" The ruse succeeded, for the Russian at once filed away and left the dominion free to the stars and stripes.

IN THE LABORATORY, in obtaining a temperature higher than that of the boiling water or of oil, the use of a sand bath has usually been resorted to by chemists. As this method, however, is characterized by certain drawbacks or deficiencies, sand being a very bad conductor of heat, a German chemist has recently proposed as a substitute the employment of pounded fragments of graphite; these have the property of letting the heat pass much better, do not oxidize and have no soiling effect on the inclosing vessel. *L'Electricite* admits the advantages presented by this mode to electricians who have to make researches in thermo-electricity, adding that small shot of iron would serve nearly the same purpose.

CHEMISTRY, which, like other sciences, has been wonderfully developed during the past century, is often mentioned as of recent origin, but many chemical facts were known to the ancients even before the dawn of historical times. Specimens of their work still in existence indicate that the ancient Egyptians had considerable chemical knowledge. They were skilled in smelting ores and working metals, had a good understanding of dyes, made glass and knew how to prevent decomposition of dead animal matter, while the priesthood evidently had some idea of pharmaceutical chemistry.

CROCODILES are the only reptiles whose nostrils point in the throat behind the palate, instead of directly into the mouth cavity. This enables the crocodile to drown its victim without drowning itself, for by keeping its snout above water it can breathe while its mouth is wide open.

MILK.—The milk of carnivorous animals is acid, that of the herbivorous alkaline.

MINING AND SCIENTIFIC PRESS.

A. T. DEWEY. W. B. EWER.

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W. B. EWER.....SENIOR EDITOR.

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SAN FRANCISCO:
Saturday Morning, April 11, 1885.

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☞ *See Advertising Columns.*

Passing Events.

The abundant rains of the past week have extended over the State, and have insured a prosperous year for California.

More business has been done in mining stocks this week than for many months past.

San Francisco and Oakland had the somewhat curious experience of a thunder storm on Wednesday evening, and by many it was considered the most serious which ever occurred in this locality.

A very large number of men are now employed on the Comstock, and the pay rolls are summing up to an aggregate of about $100,000 a month.

The Idaho miners' wages troubles still continue and unsettle mining matters in that region.

Very shortly now the prospectors will start out on their trips and begin the summer's work in the mountains. The snow will be gone before very long, except on the high mountains, and will give these men an opportunity to pursue their work.

The owners of the Eureka mills are about to construct a tailings mill with slow-motion slum pans to work the slums and tailings that have accumulated near the sixty-stamp mill.

United States Patents.

The Patent Office of the U. S. Government received during the year 1884, from the inventors of the country, the enormous sum of $1,075,799. During the same time the expenses of the office were $970,580, leaving an excess or profit of $105,219. A summary of the work of the office for the year shows that there were issued 20,297 patents and designs; that 116 patents were reissued; and that 1,021 trade marks and 513 labels were registered; 12,301 patents expired during the year, and patents were withheld in 2,839 cases for non-payment of the final fee. Of the patents issued, 19,013 were to citizens of the United States and 1,284 to citizens of foreign countries.

In view of the fact that the work is paid for by the inventors and the Government is put to no expense on their account, but really makes money out of them, the facilities of the office should be improved so that applications would be more quickly acted upon than is at present the case. The Commissioner himself calls attention, as he has done before, to the inadequacy of room and facilities for conducting the business of the office, and to the unfitness of the rooms now used for occupation by human beings. He also calls attention to the insufficiency of the facilities for conducting examinations, and recommends that an appropriation be made for a laboratory and such appliances and fixtures as are necessary. He asks that the force of examiners be largely increased, stating that the present force is inadequate. In connection with this matter he says: Many important interests are lost or greatly damaged by reason of the inability of inventors to have their applications disposed of within a reasonable time.

This is strictly true, and is a cause of much complaint among inventors, as the matter has been getting worse for some years. Greater promptness is required. Men who have made inventions after months of thought or experiment are anxious to obtain their patent rights, and are inconvenienced seriously by having to wait several months before an examination even is made in Washington. People who are helping them get tired of waiting, and the man himself is perhaps discouraged. There surely must be a remedy for this. If the old proverb about the new broom is at all correct, perhaps the new Commissioner of. Patents will make such arrangements to facilitate the public business as will accomplish better results. A force of perfectly competent men, with no idle political favorites among them, ought soon to catch up with back business, and in the future keep even with it. Were it not a fact that this is perhaps the only Department of the Government which is self-supporting and really profitable, there might be some excuse for the delinquencies, but the facts being as we have stated, excuses are not received good-naturedly.

Size of Telescopes.

At the last meeting of the California Academy of Sciences, Professor Davidson presided. He stated that he had conversed with a number of astronomers, during his recent Eastern visit, and it seemed to be the general opinion that the limit of size of telescopes had been reached for observations of precision. The largest telescopes had the advantage of collecting more light, but as precise observations could not be made with them as with smaller instruments. This was due to inherent defects in all large instruments. In all large telescopes certain great mechanical difficulties are met with. The great size of the disks of glass, causes them to slightly "sag," or become "deformed," when placed horizontally, which would not be the case when vertical, and the sagging would alter with the curvatures, which naturally interferes with the exactness of the image at the focus. In fact it seemed that the best work of precision was being done with six, eight or ten-inch glasses, although fine work is done with the present large one.

While East, Professor Davidson had called on Alvan Clark & Sons, who are grinding the glass for the large Lick Telescope. He saw the flint disk they had completed. The few defects were contained within the aggregate area of a square inch, and would have no evil effect. They had received word from Feil & Co. of Paris that work was being prosecuted on two crown-glass masses, one of which it was hoped would be found satisfactory. There have been nineteen failures already, however, so they could not be sure of those under way.

Iron in California.

Although we have only one iron mine in this State which has a plant for producing pig iron, there are many deposits and beds in California. The northern, central and southern counties all have their iron deposits, but, as stated, in only one case have we utilized this natural resource. It was not until 1880 that active steps were taken to develop the Clipper Gap mines in Placer county, and for some few months they were shut down, owing to the low price of the product. Still few counties consume so much iron in proportion to their population as California, notwithstanding this metal has here always commanded extra high prices. This comparatively large consumption grows out of our considerable requirements for mining purposes, and the extent to which we employ this material in building houses, fences, bridges, etc., the high prices we have had to pay for it being due to the fact that our supplies have been imported from distant sources of production, subjecting them to heavy freights and other charges, and compelling dealers to keep large and varied stocks constantly on hand. Years ago demands sprang up for the outfitting of quartz mills, hydraulic plant, etc., the growth of such demands keeping pace with the expansion of these several branches of mining. The substitution of iron pipes for wooden flumes for conveying water across rivers, ravines, and other depressions, has also called for a good deal of iron. Then came the era of railroad construction, adding immensely to other causes of iron absorption, all of which have kept on year by year, undergoing steady enlargement. Besides supplying the Pacific States and Territories, our shops and foundries have turned out great quantities of mining machinery and castings for northwestern Mexico, South and Central America, and British Columbia, with some products in this line for China, Japan and the islands of the Pacific, the Hawaiian sugar planters having here obtained all their mills, pans, etc. But with requirements so great and the raw material of superior quality scattered abundantly all over the State, not, as we have said, until recently were any well directed and effectual efforts made to manufacture iron in California, the cost of production and fear of foreign competition having deterred even the most enterprising from undertaking it.

Aaron's Assaying.

Mr. C. H. Aaron, the well-known metallurgist (author of "Testing and Working Silver Ores," "Leaching Gold and Silver Ores," and another work on "Assaying"), has issued this week parts two and three of the latter, as a separate publication. Part first was entirely devoted to gold and silver ores. Parts second and third (in one volume), refer to gold and silver bullion, lead, copper, tin, mercury, zinc, nickel and cobalt; and there is also an appendix to parts first and third.

The work, which is published by Dewey & Co., of the MINING AND SCIENTIFIC PRESS, 252 Market St., comprises some 160 pages. It is designed not so much for the use of students who enjoy the advantages of professional instruction, as for that of people who want to assay—whether for business or pleasure. The methods and processes are described in plain language, free from chemical formulæ, in a manner to be readily comprehended, which is, by the way, one of the secrets of the success of Mr. Aaron's former works. His descriptions are clear and plain, and there is no mistaking any directions, which, when followed strictly, lead to proper results. The book will be found of great aid in learning. We shall, from time to time, make extracts from it. The price ($1.75), is sufficiently low, to enable any one interested in such mining or metallurgy, to purchase it. The book is compact and might have been extended to much greater dimensions—after the manner of many scientific publications—without increasing its usefulness. It was considered best to keep it of a convenient size for ready use by workers.

In another column of this number of the PRESS is a description of a melting furnace taken from the chapter on "Apparatus,"

The Launch of the Arago.

The First Steel Steamer Built on the Pacific Coast.

A very important event from an industrial point of view occurred on Thursday of last week, when the steamship Arago was launched from the new shipyard of the Union Iron Works on the Potrero. The Arago is the first steel steamship ever built on the Pacific coast. The launch attracted a very large number of well-known and prominent citizens. It was quite a compliment to the builders that so many ladies and gentlemen should have come to see the results of their work, for no such gathering of representative people ever collected here before for a purpose of similar nature.

The Arago is an ocean steamer of 750 tons register. She is 207 feet long ever all, 200 feet on the water line, 30 feet beam, and 16 feet depth of hold. Loaded she will draw 12 feet 5 inches. She is built entirely of steel. She has four water-tight bulkheads and a water ballast tank under her engine and boilers, making six water-tight compartments, each independent. Being especially designed for the coal trade, she has large hatches, which greatly facilitate loading and discharge. She will carry 1,000 tons of coal, and was built for the Newport Coal Company, whose coal mines are at Coos Bay, Oregon.

The steamer is of graceful model, though the lines are full and well adapted for the purpose for which she is intended. The work upon her is well done and neatly finished, and the builders are to be complimented in turning out a handsome vessel.

The engines were designed by George W. Dickie, manager of the works, and are direct-acting inverted-cylinder surface-condensers, with cylinders respectively of 24 and 48 inches, 38-inch stroke. The propeller is 10 feet 4 inches in diameter, and the propeller shaft 9 inches in diameter. The boiler is 16 feet long, 8 feet and 6 inches wide, 15 feet high and designed for 100 pounds pressure. In each end are 2 furnaces of 38 inches diameter, and 5 feet 6 inches long; also, 348 return tubes of 3 inches diameter. The shell is of 9-16 mild steel, stamped 60,000, fitted with butt straps outside and inside, and all hydraulic riveted.

Although the steamer is a collier, she will be arranged to carry 42 first-class passengers and 24 steerage. Her deck-houses are so far only in frame.

The Union Iron Works have very complete arrangements for building and launching vessels. The vessel was built under a permanent scaffolding, arranged with overhead traveling cranes and all the necessary appliances for readily handling and placing material.

Just on the dot of the appointed hour the dog shores were knocked away and the vessel slid smoothly down the ways, and took the water amid the shouts of the assembled crowd on the adjacent wharves. Everything went smoothly and there was no accident or delay.

The steamer was brought up gradually by the lines, and then a tug brought her alongside the wharf so that those who desired might go aboard and inspect her. As soon as she was properly moored, her engines, weighing 47 tons, were hoisted from the wharf by the immense iron steam shears and lowered into the hold in position. These shears are the only ones of the kind on this coast, and the largest in the United States; the only other pair of this form being in the yard of the American Ship Building Co., at Philadelphia. They are capable of lifting 100 tons. They were built at the Union Iron Works, and were first used for placing the 80 ton boilers of the steamer *State of California*.

The two forward legs of the tripod are hinged at the lower ends, and the rear leg has at its lower end an internally threaded follower block which moves on a long screw operated by the engines. On revolving the screw, the follower is brought forward, carrying the lower end of the rear leg, which of course pushes the upper end the tripod over. The engines having previously been hoisted high enough to clear the rail of the vessel, when the crane was inclined it brought them over the hold, where they were readily lowered into position. This operation was watched with great interest by the spectators, and occupied 20 minutes. The week the 43-ton boiler was put on board by the same means. It was taken from the dock at

placed on its bearings in the ship in 16 minutes.

At the conclusion of the launch, the visitors were invited to partake of a fine lunch, and to inspect the new and extensive plant of the works. The site is a very convenient and spacious one, with fine water-front privileges, and in a splendid place for ship-building. The works are in a position now to repair or build vessels of every kind or size, and the necessary appliances having been procured for the purpose. Experienced designers and builders are connected with the works, and it is the intention of the managers to build up this branch of the business, which has heretofore been neglected on this coast. It only needs the addition of a set of plate rolls to make us entirely independent of the East in the matter of ship-building.

During the launch the proprietors of the works were kept busy explaining and answering questions and entertaining their guests. The officers of the Union Iron Works are: G. W. Prescott, president; Irving M. Scott, general manager; H. T. Scott, vice-president and treasurer; G. W. Dickie, manager; J. O. B. Gunn, secretary; and Geo. E. Ames, agent. The new vessel was built entirely of steel; the keel, stem and stern posts having been forged at the steel works of the Pacific Rolling Mills. The entire construction was carried on by the Union Iron Works. They are to be congratulated in having built up the most extensive industrial establishment on the Pacific Coast, and one which is in a position to greatly enlarge its former sphere. The buildings are all new, and many new improved appliances have been procured, in addition to the extensive plant they had at the old location in the city proper. There are no jobs of iron work which these works are not now able to undertake and accomplish.

Melting Furnace for Assaying.

The following description of an assayer's melting furnace is taken from Aaron's new work on "Assaying," just issued:

A melting furnace suitable for light work may be bought ready made, and is similar to the crucible furnace for ore assays. For heavy work, such as casting large bars, it is best to build a furnace of masonry, and, though not customary, it is advantageous to have it sunk in the ground to within about a foot of the top. The accompanying diagrams and description represent an excellent melting furnace, which the writer has built in silver mills.

This furnace is suitable for a number 30 or 35 black-lead pot, with charcoal as fuel. There is no heavy and expensive cast-iron plate on the top, and the cover may be of sheet-iron, although cast-iron is better.

The interior may be cylindrical, but is better, as shown in the figures, narrowed toward the top and bottom. The grate bars rest on an iron ring (Fig. 3), supported by an offset in the masonry. The latter is mostly of a very rough kind, as the furnace is sunk in the ground to within a foot of the top, which, besidee affording great convenience in working, obviates the necessity of iron hands or stay-rods to support it against the expansion caueed by the heat. The greater part of the lining, four-inches thick, is of good clay, very slightly moistened, and heaten round a hollow wooden core, for which part of a barrel of suitable size answers very well. It is topped with a course of common brick, and above these is a flat iron ring (Fig. 4), with lugs, which may be bolted down, or simply let in flush with the top of the furnace.

The grate bars are not built in, but are free to be removed whenever desired. The furnace is constructed, when convenient, at the base of the main smoke-stack, with which it is connected by a flue; otherwise a large stove-pipe will answer for a chimney.

When the weight of melted metal does not exceed 100 pounds avoirdupois, the pot is lifted out of the furnace by hand, by means of the basket tongs, the mould being placed on the platform of masonry which is seen in the figure on one side of, and level with the furnace. The melter stands on the top of the furnace to lift, then steps to the ground one foot lower, to pour.

If larger quantities of metal are melted at once, a lever may be employed for lifting the pot. The lever is arranged like that of a blacksmith's bellows, being supported by a rope, chain, or swivel, in such a manner as to admit of a lateral as well as a vertical movement, and at a hight of not less than six feet above the furnace, the center of which is directly under the shorter arm.

From the longer arm of the lever a rope depends; from the shorter arm a link of half-inch iron, long enough to reach, when drawn downward, into the cavity of the furnace, and terminating in a hook engaging in an eye-bolt, which forms the pivot connecting the jaws of the tongs.

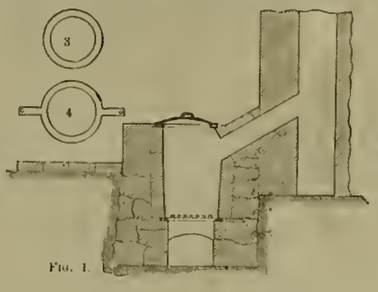


Fig. 1.

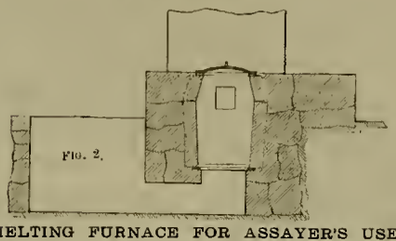


Fig. 2.

MELTING FURNACE FOR ASSAYER'S USE.

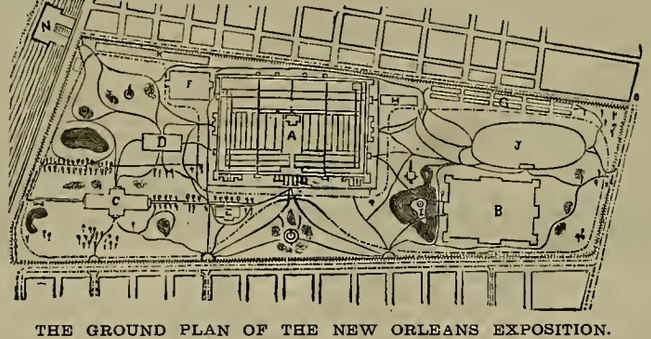
The tongs being adjusted on the pot, a ring is slipped over the handles to hold them together; the melter steadies them, while an assistant, pulling on the rope at the other end of the lever, lifts the pot out of the furnace, and swings it near to the mold, when the melter pours the metal.

The hands and arms of the melter are protected by gloves, which, in some works, are elaborately made of canvas and padding. To make a glove, I simply take an ore sack, double it lengthwise, and sew it so as to form a narrow bag, of two thicknesses of canvas, into which the arm may be thrust to the shoulder. The gloves may be wetted to prevent burning, but hot articles must not be grasped with a wet glove, because the steam produced will scald the hand; yet moisture is a good protection against radiant heat, while grasping the cool handles of the tongs.

In melting with charcoal, the best result is obtained, not by keeping the furnace full, but by letting nearly all the fuel burn away before refilling. A little practice will enable the melter so to manage that there shall be but little coal in the furnace when the time for pouring arrives, so that it is not in the way when seizing the pot with the basket tongs. The lifting must be performed without delay, otherwise the tongs may become red hot, and bend. The feet and legs of the melter may be protected by woolen armor, or by wetting the boots and trowsers; but melters and assayers must not shrink from a little scorching.

If there is much fuel left in the furnace when the melting is ended, the grate is taken out, and the embers fall into the ash pit, where they are extinguished.

Clinkers, if formed on the sides of the furnace, from the melting of the lining, or from dirty fuel, are punched off, while red hot, by means of an iron bar with a chisel end. If they were to be removed after cooling, the walls would be broken.



THE GROUND PLAN OF THE NEW ORLEANS EXPOSITION.

If a making a bar of clean skimmed metal, it is proper to throw a little resin, or powdered charcoal, into the pot, a few seconds before pouring. It prevents the sputtering which is often caused by the formation of base oxides. As soon as such a bar is cast, the top of it is covered with charcoal powder, to prevent oxidation while solidifying. When the slag or matte is poured with the metal the charcoal is not required.

MEXICAN NATIONAL HEADQUARTERS.

In a first-class office, the top of the furnace consists of a heavy plate of cast iron, sloping upward toward the flue, and provided with sliding covers. A melting furnace should have a strong draft, controlled by a damper in the chimney. The flue connecting the furnace with the stack or chimney should be 10 inches or more in width and about 6 inches high, in order to admit of placing a 6-inch cupel within it for a purpose which will appear hereafter. The floor, to a width of 4 feet on the front and sides of the furnace or set of furnaces, should be paved with bricks. A furnace, of which the interior is 16 inches square, is large enough for the melting of 2,000 ounces of silver at once.

California Day at the Exposition.

Only two months remain during which the people can see the grand World's Exposition of the progress and development of the vast resources of our country, the marvelously complete exhibit of Mexico, together with the endless collections from all parts of the globe. This Exposition, perhaps the last of a national character to be held in our country for years, is one of peculiar interest to all Americans. It is now all complete, and as it will probably close on May 31st, those who have intended going must postpone the visit no longer. During April and May the weather is generally very pleasant at New Orleans, the city being then at its best. The management state that the reports that have been circulated as to the expense of living at New Orleans, are greatly exaggerated. There are ample accommodations to be had at reasonable prices.

The management of the Exposition has recently issued notices that Thursday, May 7th, will be set apart as "California Day." The day has been designated by official action for the reception of the representatives of the Government, of the people of this State. Interesting ceremonies will take place, and an enjoyable occasion insured.

There are many Californians now in New Orleans in charge of the various exhibits from the State, and many visitors from here as well. No doubt, on the date mentioned, many others from different parts of the East will endeavor to be present. It is thought that many more people will go from here than have before visited the Exposition. Inquiring at the railroad office here it is found that excursion tickets from San Francisco to New Orleans and return may be purchased for $140. Tickets purchased at this rate are good, going within 30 days from date of sale. On the return trip the holder must be in San Francisco by June 10, 1885. Stop-over privileges are given within these limits. Recent advertisements by the Director General of the Exposition states that on this special State day, "California Day," the railroads of the country have agreed to make the lowest rates ever heretofore given. But, as stated, the roads on this coast keep the excursion rates above given.

People who intend to go from this coast should form their parties and make their arrangements immediately, and not very much time remains. The Exposition is described by those who have visited it as highly interesting in every way. The exhibits by the Government are far more complete and varied than they were at the Centennial.

California has already now many very complimentary prizes in the list of awards. The exhibits of agricultural and mineral products from this State have attracted great attention from all the visitors, the fruit display being particularly commended. The State collection of minerals, in charge of State Mineralogist Hanks, though late in arriving at the Exposition, is exciting a good deal of interest. Altogether, California is one of the States which has taken a prominent position at the Exposition, and her people should be glad of the opportunity to make the trip and see for themselves the products of other regions, where they can be compared with our own.

A short time since we published engravings showing some of the principal buildings of the Exposition. We give herewith an engraving showing the much-praised Mexican National Headquarters, and a general ground view of the Exposition. This plan is on a scale of 1,400 feet to the inch. A is the Main Building; h, United States and State Exhibits; c, Horticultural Hall; d, Mexican Buildings; e, Art Gallery; f, Factories and Mills; g, Live Stock Stables, etc.; h, Restaurants and Refreshment; i, Grand Fountain, 80 feet high; j, Live Stock Arena; k, Sawmills and Woodworking M'ch; l, Wharf, Mississippi River.

The grounds embrace the space of 247 acres, bounded on she north side by St. Charles avenue, on the south by the Mississippi river. The buildings front east toward the main portions of the city. An electric railway encircles the grounds.

The Mexican building is a structure of striking beauty, erected by the Mexican Government, and fashioned after the style of a Mexican Senor's residence. It is a quadrangle, with a frontage of 100 feet and a depth of 300 feet. Round its open interior or courtyard, runs a terraced gallery, supporting a collection of the rarest plants and flowers, and the most gorgeous birds of that famous land, seeming like a hanging garden. Surmounted at each corner and in the center of its front with light and graceful turrets, and painted in Oriental combinations of gold and green, with mediums of maroon and touches here and there of intense red, its Moresque style will attract and please the vision and give a fair idea of the taste and characteristics of the Mexican people, and fairly prepare the visitors for their wonderful exhibit. While intended simply as the headquarters of the Mexican contingent, it contains in two apartments, 64x32 feet, most attractive bazaars of Mexican art-work and bric-a-brac, feathers, wax, pottery and all the minute artistic creations for which that country is so justly famous.

Note on a Fire-Bulkhead for Mines.

The following paper was read hy Charles M. Rolker, of New York, before the American Institute of Mining Engineers:

It is now three years ago that I wrote a paper on the fire which broke out in October, 1880, at the Chrysolite mine, Leadville, Colorado, of which I was at that time manager. The paper was read by title at the Harrisburg meeting in 1881, and was accompanied by plans aud sections fully illustrating it. It was written to invite a general discussion of the course pursued in the management of that fire, since the various fragmentary and sometimes prejudiced or inaccurate newspaper accounts were not suitable to base judgment on. The paper I offered gave the facts as they appeared in the contemporaneous record which I had kept. At that time a difference of opinion had arisen with an adjoining mine, as to possible damages entailed through the fire; and a law suit was talked of. In view of these circumstances, the president of the Chrysolite company advised a temporary withdrawal of my paper. Somewbat later I withdrew it entirely, because of the unlooked-for delay in arranging the controversy referred to. It has now, indeed, been amicably settled; but the lapse of time has deprived the matter of much of its immediate professional interest.

To the urgent request of some of the members tbat I should, at least, give a description of the fire-and-gas-proof bulkbeads employed, I yield with some hesitation, since I lay no claim whatsoever to originality in these devices, and therefore question tbe value of such a paper.

The fire originated hy accident, in the Chrysolite, a mine comprising extensive and more or less irregular workings, containing immense quantities of timbering, but partially packed with waste rock or earth. Tbis class of mines is numerously reprssented at Leadville, Colorado, at many points in Utab, at Eureka and Virginia City in Nevada, etc. Moreover, the Chrysolite is connected by underground workings, for more than a thousand feet east of the seat of the fire, with adjoining properties, which have numerous shafts. The neighboring miues are situated on higher ground, the bill rising in an easterly direction; but they are worked to practically the same underground level.

The ore-deposits of Fryer Hill occur as shallow aud more or less flat deposits. The deepest ore-occurrence in tbe Chrysolite was, at the time, 150 feet below the collar of tbe main hoisting shaft, and it varied from that to 66 feet from the surface, where the only covering to the ore consisted of *detritus* and grass-roots.

Tbe ore-occurrence in tbe adjoining mines was very similar, baring local synclinals and anti-synclinals. The felsite, wbere it overlies the ore, is finely fissured. In the Chrysolite ore had been repeatedly mined up to the *detritus*, and it bad heen allowed to cave in, thus establisbing more or less connection between tbe surface and the underground workings.

Considering the rise of tbe hill to the east, and tbe fact tbat the fire started near the extreme west workings at tbe foot of Fryer hill, it is apparent that an immediate joint action on the part of all the connected mines, was not alone desirable, but imperative, in order to control the draft.

Unfortunately we were uot able to agree upon harmonious action. As a consequence, the fire was eventually drawn over a stretch of 400 feet of stoped-out ground, in places 30 to 35 feet high, and averaging, probably, 15 to 18 fest in higbt, by 35 to 40 feet in width. "Ths

System of Timbering.

In tbis mine is the square-set, Comstock style, varying, however, from tbat of tbe Comstock in having no diagonal members. Instead of these, the open square sets are filled with "cribbing," tbe sticks being 8 by 8-inch timbers; and according to the pressure and the importance of keeping tbe ground open, we employ solid cribs (each a solid mass of timbers) and open cribs (those in which space is left to fill in any waste that may be encountered). The stopes through which the fire swept had some open sets, partly cribhed and filled solidly with waste; others, solidly crihhed; otbers, partly cribbed and hut partially filled; and again, otbers, neitber cribed nor filled. The waste-filling of these timbered stopes was not a systematic one in any direction, but was the result of tbe local waste which was encountered in mining the ore. This made the approach to the fire, which, within the first few hours, communicated the flame to these cribs, extremely difficult, and even impossihle, without a proper regulation of draft. When it hecame apparent that harmonious action would not prevail, the necessity arose for the Chrysolite to isolate the hest ore-bearing portions of the mine from the fire and from the adjoining mines, in such a way as to permit our extracting the ore; moreover, this had to be done promptly, since those parts of the mine were in imminent danger. I then, of course, abandoned the plan previously tried, of putting up temporary air-stoppings, such as wooden doors (the cracks calked with cotton-waste soaked in tallow), plain earth-dams, etc. Readily constructed, permanent dams had to be built under sorely trying circumstances. Earth-dams packed wet, and up to ten feet thick, would let the carbonic acid gas through almost as though they did not exist. The stop-doors, calked hy an old sailor, looked as if they were on fire, so rapidly did the smoke and gas work through the calked cracks. In places, on account of the carbonic acid gas and smoke which were drawn through hy the eastern openiugs, men could work but five minutes at a time behind these temporary harricades, tbough they were supplied with fresh air by a No. 4½ Baker blower.

Dr. A. Serlo (*Bergbaukunde*, 3d edition, page 328) quotes from the *Berggeist*, and advises the covering of stoppings, on the side facing old works which generate gas, with a coating of asphaltum, to prevent the oozing through of gas.

The Stoppings

I adopted, were placed in gangways, drifts and winzes leading to stopes, either on fire, or in imminent danger of fire, but inaccessible, owing to ths manner in which they had been filled and timbered. These stoppings consisted, first, of a temporary stop-door, introduced to weaken the current of smoke and gas. This was simply made of inch-boards, cut to proper lengths and nailed to the posts and caps of a drift-set, selected as near to the fire as circumstances would permit. The cracks were calked with cotton-waste soaked in tar. Behind this door, earth or clay was filled in solidly for say 4 feet, more or less, the drift-timbers being left in. It is well to moisten the earth or clay and beat it down. A plain board wall was nailed hack of this tamped mass against another set of timbers to keep it in place. Tbis formed the complete temporary stopping, which, aided hy a bountiful supply of fresh air, was generally found a sufficient protection to permit the erection of the permanent stopping and bulkhead behind it. The latter was intended to prevent the spread of the fire itself, as well as the dissemination of gas and smoke throughout the remainder of tbe workings. To show the necessity of something more thorough and permanent, I may mention that a tamped earth-stopping, 10 feet long proved insufficient, even at the distance of a thousand feet from the seat of the firs to exclude tbe gas from a neighboring mine.

To Effect a Safe, Permanent Stopping.

Remove all drift timbers for a distance of from 25 to 50 feet. This is done quickly by cutting the posts nearly in two with an axe, cutting out or loosening the blocks and wedges, as far as tbis can be dofie, boring in tbe ends of tbe posts and caps auger-holes of the requisite number and size (according to the size of the timbers and tbe pressure upon tbem), to admit cartridges of giant powder, to blast tbe timbers out. As many of the cartridges are fired simultaneously as the nature of the ground will allow. Mud-sills and all fragments of timbers are removed, and the now untimbered drift is filled in with waste or earth, the finer the better. It is well to wet tbe ground frequently in order to pack the fine waste and to keep the drifts cool. Wbenever a sufficient length of drift has thus been freed from its timbers and has been filled in with waste to insure tbe safety of the adjoining works, the final gas-bulkhead is put in. The length of the eartb-dam is, of course, a matter of judguent, depending on the size and proximity of tbe stopes, as well before as behind the dam, and tbe comhustible material in them; in other words, on the supposed intensity of tbe coming fire and tbe consequent likelihood of its spreading. Preparatory to

Putting in the Gas-Bulkhead,

Ths place in the drift where it is to be erected is trimmed down to a section as nearly rectangular as possible. If the time permits, it is best to cut into the sides of the drift, say, from 4 to 6 inches, so as to get a shoulder. In the bottom a similar channel is cut, wbich connects with the sides. Should a place be chosen as a site for the hulkhead where a drift set has been standing, part of the bottom-cutting and often some side-cutting can be utilized. In case no side-cutting is resorted to, tbe old mud-sill can be utilized, as a bottom-piece, after lagging its sboulders. The extended mud-sill or bottom-excavation is then partly filled with tar and the foundation or bottom piece of timber is laid in it. Proper care must, of course, be exercised to lay the hottom-piece level, and to insure this, whatever piece of timber is used for it, its top and bottom should he dressed. On this bottom-piece a wall is built up, with such timbers as are at hand, dressed on two sides. I found 4 by 6 inches or 6 by 6 inches, of sawed sticks, a very convenient size. As the binding material for the wall, tar is used; aud to give additional stability, each stick is spiked to the lower one. The top-pieces are simply hammered in, but they have similar tar coatings; and the last one may require dressing and fitting underground. Holes, due to irregularities of walls or roof, can be filled in with clay or cement, if it is at hand. When the wall is completed, the entire face, clay and all, is covered with a thick coat of tar.

Instead of these wooden bulkheads,

Brick or Stone Walls.

May, of course, be huilt, and any little openings at the top or ends may he filled in with oement. But often, this material may not he on hand in sufficient quantities; or it may be much more expensive than the wooden bulkhead. Again, it will require longer time underground, to build a stone or brick wall, than such a wooden wall; and the wooden wall has the further advantage that nearly all pieces can be out and prepared above gronnd, with plenty of elbow-room and with as much dispatch as desired. Any good miner can prepare for, and huild such a wall, while he may uot he ahle to lay a good brick or stone wall. The blacksmith shop can turn out tbe desired spikes.

I used eight of the bulkheads, with earth-dams from 25 to 50 feet long, free of timbers, and a temporary stopping in front of these; and in no case did any gas work tbrough, or the fire spread beyond the temporary stopping. We mined for months behind tbs hulkheads, completely cut off from all connecting adjoining mines and from the fire, wbile neighbors, who resorted to otber means, could not enter their mine on account of gas.

I may finally remark, that this fire was not put out in the beginning, hose in hand (with an upcast away from tbe attacking force and a downcast supplying the fresh air) because the fire originated, as indicated, in the west workings at the foot of Fryer Hill, wbile the connecting shafts stood east of it and on higher ground; these were eithsr not kept continuously sealed or were insufficiently sealed, so that they drew the smoke and gas east into the face of any attacking party. A southern shaft, on which a stack was built, was used as an upcast for a limited period. The mine was not flooded because the district did not supply water enough to flood.

Carbonic acid gas was not used to extinguish tbe flames, because the Chrysolite itself could not be hermetically sealed, owing to the surface caves mentioned above, which had caused numsrous cracks extending from the underground work to the surface. Again, the rock itselt had numerous cracks and fissures in it, which the deposit being a shallow one, would admit air and leak gas. Finally, the use of carbonic acid would have involved tbe filling with gas of all the connected adjoining mines.

Steam was Injected

In the hope of checking tbe flames, but, where used for this purpose, proved of little use except to cool tbe ground. In the immediate neighborhood where the steam bad been discharged, we afterwards found the lower part of the timbers not burnt, but the fire had burnt the top part aud crept and spread along the roof.

The mine-sbafts were closed up as tigbt as possible, by putting in scaffolding (for some, as much as 16 feet down the sbafts) and packing dampened eartb on top to stop air-currents and to confine to the mine, as much as possible, tbe carbonic acid gas generated by the fire. The two last principles, combined and practiced, not alone by us, made the fire die out of itself, but not until seven months after we wers working and extracting ore from our isolated portion of the mine.

Our experience showed that the heat retained in a smoldering stope, long after it had ceased to give signs of active combustion, was sufficient to cause a rekindling of the firs as soon as fresh air was admitted. Even when, after tbe elapse of months, we cautiously penetrated into the burnt district, the heat of the ground was almost insupportable.

The Business Outlook.

During tbe past year tbe country and the entire husiness world, in fact, has beeu passing tbrough a period of most unusual depression. Tbe fact does not need the added emphasis of comparative figures, whicb have been given time and again during the last few months.

What we have now to note is the unmistakable signs of returning prosperity. There is already a well defined rift in tbe clouds of adversity, which is gradually growing wider and brighter; or as an exchange bas expressed it, "the wave of hard times has spent its force and its waters have begun to recede. Tbese periods of depression are like the tides of tbs ocean, the ebb follows the flow. It is well that tbis is so, for otherwiss there would be no check put upon husiness and the undue inflation of prices," and, as might also be added, of excessive over-production.

What we have now to encounter and adjust is the very general discontent of tbe working classes hecause of the necessary re-adjustment of wages, as the inevitable consequence of the diminished profits of capital and the sharp competition set up between different localities and diverse nationalities. To this we must also add the proverbial impatience of American business men, because the benefits of returning prosperity are not immediately and more fully felt. It would be well, and better for all, if we could wait awhile with patience for tbe new turn of affairs to give animating force and a new vitality to business.

A cotemporary of this city has hcen interviewing a number of our business men in regard to the cause of the depression and the present outlook for the near future. Nearly all the persons interviewed lay great stress upon the importance of encouraging a large immigration of desirable families, who can come with means, and strength and will to build up homes among our numerous agricultural valleys, and to occupy the vast unimproved tracts which have been long held for speculative purposes, but which are now heing divided up into small holdings at more reasonable prices than have hitherto obtained. We need this class of emigrants to consume, at home, our surplus cereals and manufactures, and to fill the void in the market for California products which has been made by the opening up of Oregon and Southern California to a direct trade with the East through the Northern and Southern Pacific Railroads, which have recently been opened for such traffic, to the disadvantage of this city.

New and Remarkable Gold Deposit.

Tbrough tbe courtesy of Mr. John Musson, of Sydney, New South Wales, the *Engineering and Mining Journal* has received tbe report of Mr. R. L. Jack, of the Queensland Geological Survey, on the Mount Morgan Gold Deposit.

Mount Morgan is only twsnty-two miles from Rockhampton, on the Fitzroy River, and not more than half that distance from the Central Railroad. It is an isolated cone, rising from tbe plain through which runs the river Dee, the plain being flanked east and west by bluffs of Mesozoic sandstone, out of which the valley has evidently been carved down to the level of tbe primitivo stratified rocks that now form its floor. These old shales and quartzites are riven by dikes of rhiolite; and tbrough them have evidently come to the surface geyscr springs, the deposit from which has formed the cone of Mount Morgan. The water has, besides gold, carried in solution silica, iron, alumina, etc. But tbs gold seems to have been precipitated chiefly in the cup of the geyser, and to be richest in a large mass of iron ore, which, in the form of an inverted cone, forms the vertical axis of the mountain, and in the nodules of iron ors that occur in certain soft cellular siliceous layers. These alternate witb more or less ferruginous layers, all of which radiate, like the leaves of a fan, from the base of the cone, and enclose the iron ore. Gold occurs in all the layers except in a siliceous earth, and therefore its association with iron is certainly not accidental.

Mining is conducted by quarrying down ths apex of the cone, and from an open cut 100 feet below the summit. Tbe yield of the rock is almost fabulous. Working returns are not given; but fair samples selected by Mr. Jack gave from a quarter of an ounce to 10 ounces per ton, and others sent to the Sydney Mint to be experimented on gave 85 ounces per ton. Some of the rock in these samples was selected.

Prolonged amalgamation extracts only about half the gold; but during the few months the mine was worked, prior to the puhlication of the memoir, tbe Sydney Mint had received 10,000 ounces. It differed from any other gold known to commerce in tbat it was unalloyed with silver, assaying 99.7 psr cent of pure gold, the 0.3 per cent being copper and iron.

Copper.

The question of production or prices is now confincd to the Lake, the Arizona and the Montana mines. Prices have reached sucb a point that, unless some new and unexpected developments are made, the otbsr districts are practically of no account. At the present rate of prices it is said tbat only four or five of ths Lake mines mors than cover expenses. The larger Lake mines have splendid plants, cheap fuel, low wages and while working very cheaply produce an exceptionally fine quality of copper. The large Arizona mincs are said to be working at a profit now, and, quality considered, can lay down their product at the seaboard at very close to if not full as good figures as tbe Lake. The Montana mines are mainly well managed and with good plants. Some of them, working the richer argentiferous ores, gain two or three cents per pound by the silver recovered. All these mines bave a high grade, but impure ore. The wages are high and there is considerabls room for reduction in this respect. Both the Arizona and Montana mines are now well connected with the railroad system of the country, and have all tbe advantages accruing from tbis at present, though there is room for lower freight rates.

Should ths present low rates of copper prevail throughout the year and a number of ths smaller mines he compelled to close in consequence, it is probahls the production of 1885 will equal and probably exceed somewhat ths production of 1884. This will be accomplisbed hy the increased output from large mines with the view of thereby increasing the profits. The Calumet & Hecla has expressed its intention in so doiug. Some of the other Lake mines will probably adopt the same policy. As to the Arizona mines, the question of an increased output depends merely upon whetber the owners consider it wise to exbaust the mines at present low profits.

The United States has, within the past four years, grown from the position of a subordinate copper market to that of the controlling market of the world, and the prices of this metal in the markets of the world are now regulated by the production of this country.

THE directors of the famous Quehrada copper company state that tbey have contracted with a smelting company for the sale of 30,000 tons per aunum, for five years, of their ore, on the basis of Chile bars. The price is undcrstood to be equal to 8s. 9d. per unit, with bars £47 10s. per ton. The average of their sales for 1884 was 9s. 9d. per unit, and a considerable stock was carried over to this year. The total production was 4,000 tons fine. In 1883 the average price was nearly 11s. per unit, which left a loss of £3,963.

THE Southern Pacific Railroad has sent to the New Orleans Exposition nearly 10,000 littls slahs of polished redwood, to he given to all who are interested in California's products.

ENGINEERING NOTES.

The Canadian Pacific.

"One hundred million dollars' worth of land and as much more in money subsidies is about what tho Canadian railway has cost Canada up to the present time," said a well-known exmember of the Canadian Pacific railway syndicate a short time since. "And this," he continued, "is only a drop in the bucket to what that great railway project will cost the country hereafter." The gentlemen who compose this syndicate it is generally conceded will not undertake to run the road after it has been completed. They will hand it bodily over to the Canadian Government, and that institution, which has acted so benevolently toward the Canadian Pacific railway syndicate, will run the railway and make up deficiencies, which must necessarily be involved in the operation of such a road out of the public treasury. That the portion of the road from Winnipeg to the Pacific Coast must for many years to come be run at an immense loss of money, few, if any, who are well informed on the matter will attempt to dispute. Much of the country through which the railway runs west from Winnipeg, as well as between Port Arthur (Thunder bay) and Rat Portage, is totally unfit for any kind of agriculture. Therefore it must be admitted that the great bulk of the Eastern traffic must come from the Pacific Coast. The trade from the Orient to British Columbia is very small, and with great competition of steamship lines to San Francisco and other American ports it must remain very limited for years to come, so that the railway may look for very little support in that direction. The trade from British Columbia itself to Eastern Canada and Europe is very light, being confined principally to the products of the salmon fisheries, which would not of itself keep an ordinary tramway running.

Owing to the greater portion of the farming country in the Northwest being situated between the American boundary line and the line of the Canadian Pacific, at a very considerable distance from the Canadian railway, the cereals it might otherwise carry to the East are out of its reach. It might construct a branch line into this farming territory, but it objects to carrying any portion of a railway too near the American boundary, fearing that if its main line is tapped by American western roads what little traffic it may command will be taken away from it by them. It was for this reason, it will be remembered, that the Manitoba Southwestern railway was disallowed by the Government. The difficulty is keeping the road open in the severe winters experienced in the Canadian northwest, and especially that portion of the railway which runs along the north shore of Lake Superior, which is for hundreds of miles over a barren, exposed waste of land, which, along the coast of the lake shore the railway is intended to run, has during the past winters been rendered almost impassable by the accumulation of snow and ice.

Reclamation of Florida Swamp Lands.

The reclamation of Florida Swamp lands is being pushed vigorously forward under the Disston Company. The Territory in which the company proposes to operate is 225 miles long with an average width of 75 miles. Canals are being cut to drain the lakes and swamps. The first canal was cut 18 months ago, and is 60 feet wide, 10 feet deep and 4 miles long. The effect of this drainage was to reduce the level of Lake Okeechobee, having a surface of 50 square miles, to the extent of 7 feet. From this lake several canals will be cut southward and eastward to the ocean. These canals will be from 15 to 20 miles in length, and will afford good waterways to the interior. The company has in use four dredgers and two steamers. It has also established a sugar plantation at a point, which two years ago was perminently under water. The growth of the cane thus far surpasses all expectations.

The locality of the lake named is in the northerly portion of what is known as the "Florida Everglades," which comprise almost the entire southern peninsular of that State for 150 to 200 miles north of Cape Sable. The northern shores of Lake Okeechobee was the scene of the terrible wars which were waged with the Seminole Indians, the remnants of whom, to the number of about 40 families, still reside there maintaining their original habits of living by hunting and fishing in a tribal relation governed by a lineal descendent of one of their ancient chieftains.

The Panama Canal.

EDITORS PRESS:—Will you please inform us if the design is to place locks in the Panama Canal, or if it is to be a tide-water canal as presumed in the article enclosed to you, and oblige,

yours truly, F. L. CUSHING.

Silver Reef, Utah, Feb. 24, 1885.

We believe the only lock in the Panama canal is to be a "tide-lock canal" at the western terminus, on the Pacific Ocean, so as to maintain at all times a sufficient depth of water for ships to go in and out. This has been found necessary, owing to the high rise and fall of the tides.

BOSTON is to have an elevated railroad.

The Tanning Industry.

Mention has often been made that with all the patent appliances for quick transformation of hides into leather, none exceed or even equal the old-fashioned way and hand-labor. Some writers and investigators claim that the most of the rapid methods now in use are positively injurious to the products, and that large quantities of inferior leather are found in the market as a consequence. As to the truth or falsity of these claims we are not in a position to venture an opinion. Our present intention is to make a brief reference to some asserted improvements, which have been quite recently introduced into the art of tanning.

A New Tanning Process.

A patent has recently been granted for a very simple process of tanning, which is thus described: For every 100 lbs. of skins dissolve 4 lbs. bichromate of potash in about 6 or 8 times its quantity of boiling water; then add 2 lbs. muriatic acid. Stir well and let stand about half an hour; then add this liquid to the vat containing water sufficient to cover the skins suspended in it and kept sufficiently apart to allow the liquor ample room to penetrate the skin uniformly, and leave the skins in this liquor until penetration of the chrome is complete, which is discernible by cutting off a small part and noting in the section the depth of the penetration. The advantages claimed are: its adaption to any sort of skin or hide, or even furs or chamois. The leather made by this process is said to be more tough and denser than that produced by the old style of tanning by tan bark, sumac or gambier. Prepared by the process the leather can be boiled without injury.

Another New Process.

One John Shaw, of Hindmarch, near Adelaide, South Australia, has invented a new method for tanning with soap and oil, together with carbolic acid. The skins which have been limed in the ordinary manner, also haired and prepared, if for the production of sole leather, are placed into a tan bath consisting of a mixture of ten gallons water, in which two cwt. soap are dissolved, and contain one gallon carbolic acid, in which the skins are left until they have become converted into leather. This process can be materially accelerated by adding a pint of fresh carbolic acid to the tanning fluid from time to time. For the purpose of producing another softer leather the raw, limed and haired skins are for one or two days placed into a mixture of four parts earhon bisulphide, and one part carholic acid, after which they are washed.

A New Tanning Material.

One of the novelties of commerce is a new agent in tanning, the tannekaya bark, which comes from New Zealand and is of recent discovery. Last year 375 tons were exported, the greater part of which went to Grenoble, France, where it was used in dressing leather for gloves. The bark costs $40 per ton in its native country, and the freight is as much more. It contains 28.66 per cent of tannin, whereas oak bark contains only 8.85, and hemlock 9.5. The tannekaya tree is very beautiful, and, as its timber is very useful, it has every point of value. It belongs to the fir species, and, it is thought, would thrive well in some portions of the United States.

The Safety Pin—Its Antiquity.

Taking the common "safety pin" as a starting point, the various types into which the variants fall are classified and exemplified very thoroughly in this little study. Not a single part of the simple, though not primitive, instrument, but have suffered some strange metamorphosis. Now the catch is fastened into a disk or diamond-shaped plate, now lengthened into a tube, now knobbed and put back to the bow; the bow is alternately shortened, lengthened, squared, rounded, decked with studs, grain work, braces, rings, plates, amber beads, figures of birds and beasts and men, or tricked with hanging ornaments; while the spring is found doubled, multiplied into coils, changed into a solid roll, or bulge, or magnified into gigantic proportions in relation to the other parts of the brooch. The Italian groups, with either simple or two-stringed bow, are very distinct; the Hungaro-Scandinavian examples are marked by their spiral catch and coil spring; the Greeks characteristically seized on the spring as the fibula, and curled the wire into two spirals, from the center of which catch and pin spring. The history of the fibula can be traced for some 3,000 years, starting from its first appearance about ten centuries before Christ.—*The Academy.*

AN IMMENSE ARTIFICIAL FOREST.—The largest artificial tree plantation in the world is located in Scotland. It is known as the Seafield Tree Plantation, and is used both as a hunting park, and for the growth of timber for profit. The Seafield estate comprises 160,000 acres in Inverness-shire, 50,000 acres in Banffshire, and 97,000 acres in Morayshire, the rental amounting to about £75,000 a year. Castle Grant, in Strathspey, is the old seat of the family, and around it are some of the best grouse moors in the Highlands. The encumbrances on the Seafield estate amount to nearly £800,000, but the Strathspey woods will, in the course of a few years, enormously increase the income. It was estimated recently that in 30 years they will realize £50,000 a year, not merely for one year, but regularly year after year. There are a hundred square miles under timber in the district, on the estates of Lady Seafield and the Duke of Richmond, principally the former. The grandfather of the late Earl commenced planting about 1820, and since 1855 the work has been done in a thoroughly systematic manner. In two plantings near Carr Bridge there are 35,000,000 trees on 25,000 acres. The trees are principally larches, spruce and firs; but 105 varieties are grown on the estates, and there are large nurseries near Abernethy. Over 200 persons are employed in the forests, which are well worth a visit from any one interested in the subject.

Leather from Sinews.

An artificial leather, which is mixed with five to ten per cent of sinew and pressed into sheets like ordinary leather card board, has been recently made in Germany. Both materials are made separately. The leather pieces are washed, cut, boiled in alkaline lye, torn, neutralized with hydrochloric acid, and finally carefully washed once more to remove all traces of acid. The sinews are treated similarly, but steamed in an acid bath until they are like glue. When they are thus prepared the materials are mixed, pressed into sheets, moistened on both sides with a concentrated solution of alum, and the upper surface is at last given a thin coat of caoutchouc in solution with carbonic bisulphide.

BICYCLES.—The manufacture of bicycles and tricycles is conducted in England on a much larger scale than in this country, the capital invested amounting, it is stated, to $15,000,000, and employment in their manufacture is given to 8,000 persons. There are said to be 300,000 cyclists in that little isle—a number that, if formed into an army to march against the Mahdi, would constitute a formidable force, but, we imagine, would be of very little effectiveness in the Soudan.

DURING the quarter ending March 31, 1885, very nearly 300 new buildings have been undertaken in San Francisco at an estimated cost of over $2,000,000, over 45 per cent of which cost goes into permanent improvement of brick and stone. During the same period of 1884 the new buildings projected numbered only 198, at a cost of a little over $1,000,000. This certainly is a satisfactory showing.

SEA FOWL SMOOTHING THE TROUBLED OCEAN.—A Fiji writer remarks that when flocks of tern and other sea fowl rest upon the sea in great numbers the water becomes smooth, and there in "not a ripple to disturb them." This is ascribed to oil emitted by the birds.

CHILLED IRON is the most impenetrable of all metals. In warfare it is the only sure defense against heavy modern guns. A plate of chilled iron may be thin enough to be shattered, but no such plate has ever been penetrated.

GOOD HEALTH.

NECESSITY OF RELAXATION. — There is a homely saying among the fishermen that those who will not mend their nets will soon be unable to catch fish; and one is seldom found so improvident as to let a hole grow larger and larger until the net is useless. The nearest approach to absolute rest is sleep, and of this every man, woman and child should have abundance, proportioned to his constitution and occupation; but there is a relative rest, quite as important, and more neglected by most busy men and women; this rest is recreation.

The "I haven't time" excuse, although as popular as ever, is sadly threadbare. A man owning property can invest a thousand dollars though he withdrew from active business if he is sure that the money will double itself. We all have twenty-four hours in every day to invest, and if one hour withdrawn from business can be better invested, is it not a wise thing to do it? Relaxation, however, to be profitable, must be whole hearted. It is not rest for the business man to bring his affairs and worries home with him. It is not rest for the student to brood over theories and formulas when he walks, neither is it rest, to take one's fears and anxieties to our friends table. If we have no heart to throw off these burdens we should make the effort in spite of ourselves. We have been bound to our cares as the convict is to his ball and chain; it is time to master circumstances instead of being their slaves.

Mental slaves are more dependent upon the physical condition than we are inclined to think. Irritability means overstrained nerves; the "blues" and "black butterflies" are other means of indigestion and a poor circulation. Recreation, it is to be remembered, is neither dissipation, nor yet absence of activity. Complete change of thought is relaxation; and Hood is quoted by a recent writer as saying that the Quaker always enjoys life, for he makes a pleasure of his business and a business of his pleasure.—*Every Other Saturday.*

ASPHYXIA FROM COAL GAS.—"You may set it down," said an eminent medical practitioner, "that the stages in asphyxia from coal gas are confusions of ideas, delirium, muscular spasms, convulsion and paralysis, unconsciousness and finally failure of the heart's action. In other words, unconsciousness is one of the last stages, which leaves the natural inference that the victim is aware of approaching death until the very last beating of the heart. The suffering must be terrible, because the duration of the last struggle, in which the body is entirely passive and prostrated while the mind retains every impression more vividly than even in its normal state, is not less than thirty minutes and in some cases longer than an hour.

"This medical view of asphyxia from coal gas is substantiated not only by the truthful relations of persons who have been rescued while nature was about to succumb, but also by the condition of the body after death. The only irrational symptom disclosed by the scalpel of the operator is the presence of dark, venous blood in the right side of the heart and the venous system. The left chambers of the heart contain only a small quantity of dark colored blood, while the vessels of the membrane and sinuses of the brain are filled with it. This demonstrates plainly that the brain was the last organ to succumb."—*Chicago Herald.*

TURNS THE HAIR GREEN.—A Wallingford, Conn., correspondent of a Hartford paper writes that a peculiarity of a workman in German silver spoons is the color of his hair. Years of labor in the trimming or buffing room of a spoon factory dyes the hair of an operative pale green, which it takes years to change. Aside from the disagreeable and remarkable dye the manufacture is extremely dangerous. The principal part of the composition of German silver is copper. The fine emery wheel used in trimming and shaping the spoon fills the air with minute particles of this noxious poison that soon fill the lungs and cause a disease similar to consumption. To escape this a sponge is worn over the nostrils of the workman.

POISONED BY EATING WILD PARSNIPS.—Two boys at Floyd's ranch, Nevada, ate some wild parsnips a few days ago. Another boy tasted the poisonous root, but not liking it spit it out. Antidotes were given the two, but to no avail. They died almost instantly, with the same symptoms that strychnine causes. The wild parsnip is very common along the Nevada streams and cattle frequently die from eating it. This is the first time that any person has died from eating it for a number of years. It resembles the horseradish in taste and appearance.

AN ANXIETY THAT BREEDS ILL HEALTH.—The very anxiety for health which Sir James Paget and the sanitarians inculcate is an anxiety that breeds hypochondriacs, and tends, to that extent at any rate, to defeat its own object. Every one must admit that the highest form of health is unconscious health, just as the highest form of beauty is unconscious beauty, and the highest form of moral excellence is unconscious moral excellence. The typical healthy man is not aware of his health; he does not think about it at all.—*London Medical Times.*

DEATHS FROM HICCOUGHS.—A recent number of the Chattanooga *Times* says that there has been three deaths in that city already from a mysterious malady, the only specific symptom of which was hiccoughs. Physicians were disposed to regard this merely as a coincidence, but later developments make the matter more serious, and the subject is proving very puzzling to several of our leading physicians. There were two more cases which were in a very critical condition, and death seemed inevitable.

FAT AND ADIPOSE TISSUE.—Globules of fat occur in many mollusks and insects, but true adipose tissue is found only in back-boned animals, particularly the herbivorous. In the average man it constitutes about one-twentieth part of his weight. The fat of animals has the different names of oil, lard, tallow, suet and spermaceti. It is a reserve of nutriment in excess of consumption, serving also as a packing material and a preservation against cold.

CHLORIDE OF METHYL AS A REMEDY FOR NEURALGIC SCIATICA.—Chloride of methyl, sprayed, produces a degree of cold represented by 23 degrees C. or 94 degrees F. M. Debove has played a jet of this cheap fluid on the skin along the whole length of the limb corresponding to the course of the sciatic nerve and its main branches, effecting almost instantaneous relief to the sufferer from neuralgic sciatica.

SINGULAR CIRCUMSTANCE.—Mr. Gresham a grocer at New Albany, Ind., was stooping down measuring onions, and felt something give way at the knee. Supposing it to be his trousers he continued his work, but in a moment or two fell back upon the floor. It was discovered that the muscles of the knee cap had given way. The injury is a very serious one, and he will never have full use of the limb again.

BAD AIR AND INSANITY.—M. J. Harrington Douty, of the asylum for the insane at Worcester, England, declares that insufficient oxygen, or merely vitiated air breathed constantly, will produce melancholia.

A LINIMENT of equal parts of oil of winter-green and olive oil, or soap liniment, is said to afford almost instant relief from pain in acute rheumatism.

ABOUT 900,000 bananas per month are consumed in San Francisco.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA

Amador.

INDIAN DIGGINGS.—Amador *Ledger*, April 3: Hale and Baughman are doing good work. They are working a six-inch nozzle and there is enough gold visible on the bed-rock to satisfy them that they will clean up a small fortune. Oxby is in good pay, and will not get left. The Guadaloupe, owned and operated by Leventon is in rich gravel, showing a great deal of coarse gold. Ball and Jenkinson are still operating the Frances Cullings. This is a fat piece of property, and the boys feel justly proud of it. Jeff French has purchased the Big Bonanza claim from Kohler. Consideration $3,000. It will be worked by a six-inch nozzle and full force.

MISCELLANEOUS.—Work on the Ione Company's coal mine near Dosh's store is progressing favorably. All difficulties with water and quicksand have been overcome, and the coal deposit has been reached. The quality of the coal promises to be superior to any heretofore met with in the valley. Grading for the 20-stamp mill in Hunt's gulch is completed. S. D. Shugert went below this week to inspect the machinery, previous to its shipment.

VOLCANO.—The mine owned by the Petty boys, located at Fort Ann on Dry creek, about three miles from town, looks rather encouraging. The tunnel extends into the hill about 100 feet, and the ledge is three feet wide and contains free gold in great quantities. Work is now progressing day and night. A large quantity of rock is on the dump, which will be immediately crushed. Benjamin Ross, ex-Supervisor, owns a quartz mine near the slaughter house, about one mile from town. A tunnel has been run into the hill a distance of 150 feet. The ledge is three feet wide and shows free gold. The last crushing paid $30 per ton. About 12 tons are now on the dump. Work progresses both day and night.

Calaveras.

STRUCK GOOD GROUND.—Calaveras *Chronicle*: We are pleased to report that rich ground has been struck in the Anthony Bros.' gravel claim on the west side of Old Woman's gulch. The owners are highly deserving of success for their steady perseverance and we congratulate them on their find.

El Dorado.

MOUNT PLEASANT.—Cor. Placerville *Overseer*, April 7: The Mount Pleasant mine, formerly the property of Stukslager & Plumtree, south of here, has been purchased by Hub A. Wood and Wallace McKinney, and they have been at work cleaning out one of the old shafts, which was some 40 ft in depth, and are now working in the solid rock at a depth of 60 or 70 ft. The rock looks fine and prospects well. Some $80,000 to $100,000, and perhaps more, have been taken from this mine in former years. The present owners have gone to a good deal of expense in putting in a car and other fixtures. Hub Wood says he is confident that they can make a stake on the mine yet. It has been a pocket mine, and by no means easy to work, but when a pocket was struck it panned out rich.

Mariposa.

GOLD.—Mariposa *Herald*, April 4: The old Nat Harbet or Rollins mine, situated at the head of Sweetwater, which was relocated by Pete Gordon and others and sold to James Grove, a year or so ago, was sold recently to Messrs. Carter & Adams of San Francisco for $15,000. A gentleman by the name of Peck is superintendent of the mine, and we understand is working a force of 18 men.

Mono.

ANOTHER STRIKE AT SWEETWATER.—Bodie *Free Press*, April 4: Mr. Patterson, after whom Patterson district is named, made an important strike in Frying Pan gulch the other day. It is a very rich gold vein and was cross-cut by R. A. Cameron who had come to Patterson's assistance and advised him which direction to take. Cameron had previously struck it rich in an extension of the same lode.

THE STANDARD CON. RESUMES WORK.—Bodie *Free Press*, April 4: Almost immediately after the closing down of the mine and mill at the Standard Con. on the 31st ult., miners were selected and put to work again in the mine. President Pettibone's intentions are to increase the force in the mine from time to time as he finds it practicable, and to resume milling after some necessary repairs and the accumulation of ore are made, which will mill considerably higher than the low-grade proposition that does not much more than pay expenses of extracting and reduction. The plans as now contemplated will in due time set all the machinery in motion, employ the usual number of men and pay a regular profit, while the work of prospecting the property systematically may at any time open new and important developments. There is plenty of virgin ground to be explored and the various theories advanced respecting the existence of ore bodies equal to those worked in the past appear to be well founded.

BODIE CON.—At the mill 160 tons of ore were crushed during the past week. The bullion from this will be shipped with the product of next week's run. At the mine the men were employed in getting out ore. Thirty-nine men employed.

MONO.—The Mono south drift has been extended during the past week 15 feet; its total length being 137 feet. The winze has been sunk 8 feet; its total depth being 45 feet. Six men employed.

Nevada.

MOORE'S FLAT.—Cor. Nevada *Transcript*, April 4th: Although I am an outsider, I was living here long before the prospecting on the Metropolitan commenced by the present owners. Mr. Buck deserves much credit for its development, but George Abraham, formerly of Grass Valley, is the man to have the greatest praise. He commenced working on said Metropolitan ledge the 13th of April, 1875, and has now three tunnels in on the ledge, one under the other, with about 100 feet of backs between each. He has between 700 and 800 feet of tunnel driven and is still at it with great confidence of striking more free gold. He has good prospects in sulphuret rock, but not much free gold as yet. The sulphurets are very good and plentiful. I should think to look at it that the ore would go five per cent. The ledge is from 3½ to 7 feet thick with splendid walls. In fact it is the best defined ledge I have ever seen, and I have seen many. Abraham's present tunnel is from 400 to 600 feet under where Buck struck it, and he can still go down and bring in a tunnel 500 feet deeper and have plenty of dumping places. Abraham has splendid working facilities, with a good mill site at the base of the hill, and plenty of free water the year round running through his claim of 3,000 feet and within his bounds. Mr. Abraham gave Mr. Buck the privilege of running a crosscut tunnel to prospect the extension of said Metropolitan ledge above the Miners' Ditch. So Mr. Buck struck the ledge in Abraham's ground and it shows good prospects of free gold. He has all of sixty or seventy feet to drive to get into his own ground. A gentleman from Tehama county by the name of Nellis, came here last year to prospect for quartz. He was shown several ledges and started to work on one down near the Middle Yuba river. It runs in a southeasterly direction to the head of New York ravine. The name given the ledge by Mr. Nellis is the Eagle. There are eight claims taken up on the Eagle ledge. Mr. Nellis has good prospects. Messrs. Davis & Hathaway have very flattering prospects. They have the northwest extension. The southeast extension is owned by Johnson & Co.; the next by Professor Crosby; the next by George Abraham and Wm. Buck; the next by S. L. Blackwell; the next by Mr. Sullivan, and the next by Copperas & Dugan. There is another ledge near the Copperas & Dugan claim owned by two Nevada City miners named Hart & Bond. It shows good prospects of free gold. I think Moore's Flat and Snow Point will be great quartz mining camps before long.

GREEN MOUNTAIN MINE.—Grass Valley *Union*, April 3d: The lessees of the Green Mountain mine, on Osborn Hill, have completed their steam hoisting and pumping works, pumped out the mine, and are now taking out quartz for crushing. The old shaft is down 107 feet, and an incline 30 feet lower. The intention of the lessees is to precede with the sinking of the incline to open another level, while at the same time they will continue to take out ore from the level that is opened. The Green Mountain yielded very rich quartz some twelve years or more ago, but the Company got into costly litigation, and work was stopped. There are no legal difficulties to embarrass the work now.

MINES LOOK WELL.—Foothill *Tidings*, April 7: There is plenty of prospecting going on in this district. The Idaho mine has greatly improved during the past week. The water is all pumped out of the North Star mine, and in a very short time a full corps of miners will be put to work. Several shafts on the property worked by tributers disclose a good ledge of fine ore. Before very long the Empire mine will be run by water power. From the eminence of Ophir hill the water can be conveyed to all parts of what is known as the southern mining district of Grass Valley, and there are numerous gold bearing ledges that will pay for working, provided water power can be had. The Maryland mine has its pump running regularly and the company are sinking for their pay chute. The Imperial on Deer creek, is still working and there has been no particular developments since our last report. The Empire is running night and day and is taking out the very best kind of milling ore. There are but few, if any, mines in this State that are better gold providers than the Empire. Architects and draftsmen are now at work drawing plans for the addition of 30 stamps to the Empire mill. Then there will be 50 stamps in all and they will be kept busy night and day for many years, according to all appearances. The New York hill is looking well and gives great encouragement for the future. The Pennsylvania, joining the Empire on the west, is working with promised good results. As soon as water power is introduced into the Empire mine the Allison Ranch Franklin will start up (it should never have been closed down) for then they can run it by water power. All of the custom mills in and around Grass Valley are kept busy crushing ore for prospectors, but it is seldom that the yield ever gets into the newspapers, the owners of the ore saying that they would rather keep the yield private.

San Bernardino.

MESKAL.—Calico *Print*, April 3: W. A. McFarlane of Meskal, near Ivanpah, stopped at Calico a few days while on his way to San Bernardino. He reports the mines at Meskal belonging to him and S. A. Barrett, as looking well. They have 100 tons of $100 rock on the dump and 300 or 400 tons more in sight in the mine which has been considerably developed, 100 tons having been milled by a former management, but of a low grade. Mr. McFarlane intends to return to the mines with a small mill. They have a good prospect and feel confident their operations will be profitable.

Shasta.

THE WINTHROP MINE.—Redding *Independent*, April 4: The new reduction works, now being erected at Copper City for the Winthrop mine, are nearly completed, and, when finished, will be one of the finest and most complete mills on this coast. The works are being put up regardless of expense by an English Company, who have leased this valuable property for a term of years from the owners, Messrs. Spruance & Stanley of San Francisco. It is now calculated that they will be producing bullion by April 20. The owners and lessees are confident that they have now got hold of a process whereby they can profitably reduce the ores found in that section, and as we now see the process is about to have a fair test we cannot but feel assured that the permanent prosperity of those mines is soon to be fully assured. This will be a steadily increasing benefit to our county, and we are very glad to see it.

QUARTZ AND PLACERS.—Shasta county *Democrat*, April 1st: The placer miners of Buckeye are praying for more rain. They want more water to clean up with. Billy Litgen of Buckeye district last Saturday struck a pocket from which he took out $23.50 in three pans of dirt. We hear that the Pioneer company has struck good ore at a depth of 40 feet. They are now running night and day shifts. Instead of as was reported last week that George Klein of Deadwood had sold his mine for $16,000, he has bonded it for one year for that sum. Keifer & Tucker who are sinking on the Monitor near the Silver King last Saturday struck 30-ounce ore. This week the ore looks much better as depth is attained. We are told the new Copper City mill will be running by the first of next week. The gentleman who was sent from 'Frisco to superintend setting up the mill returned last Thursday. Bob Campbell is sinking a shaft on a gold quartz lead on the head of Oregon gulch for a half interest in the claim. It is owned by Lowrey & Brincard. The vein is not over 20 inches wide, but the ore is high grade. Work on the Bullychoop tollroad will commence with a large force of men next week. Mr. John Q. Finch is already on the ground, with headquarters at Watson's gulch, arranging the details of an active campaign against the rocky fastnesses of the towering mountain summits. The mill recently erected by Messrs. Patten & Day at Sunny Hill closed down last week after a short run. It was found after running the mill for a short time that, owing to the presence of antimonial and zinc sulphurets in the ore, the ordinary plan of catching the gold on plates would not answer, and a new method of working will have to be adopted. Martin Leach and Joseph Penrose, who own a promising claim about a mile and a half west of the Hall reservoir, are running a tunnel to tap the vein 80 feet deep. McDaniel & Co., who own a claim adjoining, have a shaft down about 30 feet, and are now running a tunnel to tap the vein about 70 feet. The owners of these two claims are getting encouraged with their prospects. Last week we took a trip over to Star Gulch to see what Dan O'Neal was doing on the Florida. We found him hard at work taking out some very rich rock. On the dump we failed to find a piece of rock that did not show more or less free gold. He has three men employed and is running a horse arastra which crushes from 250 to 275 pounds of ore a day, and with this crude way of milling ore he cleans up from $700 to $900 a month, which proves that the Florida is a pretty good property. At that rate a small stamp mill would hammer out twenty-dollar pieces lively. Dan thinks he will put up a stamp mill this summer. Work has been resumed on the old Chicago mine on the South Fork of Clear creek, under the management of some San Francisco parties. Mr. Buckley an old Comstock and Bodie superintendent is directing operations. The Spencer mine near Ono has developed into one of Shasta county's bonanzas. At the bottom of the 70-foot shaft, sunk from the tunnel level, the vein shows a width of 9 feet of $30 rock. The course of the vein is northerly and southerly with an inclination to the east of about 80 degrees. The hanging wall is slate and the foot wall is porphyry. Mr. Spencer has just put in a 12 ton crusher which started up Monday. It is his intention to erect a stamp mill during the summer.

Sierra.

AT THE SIERRA BUTTES MINE.—Sierra Co. *Tribune*, April 3d: On Saturday evening last the scribe paid a visit to the new mill at No. 9 tunnel, and under the care of two very accommodating gentlemen took a glance at the extensive improvements made there. The mill is a model of neatness and convenience, and contains every improvement which has been made in the past twenty years to the business of quartz mining. Forty stamps are crushing ore at present, and four more batteries of five stamps each are in course of construction. The water which furnishes the power comes from the dams above, and is used on a hurdy-gurdy wheel, under a heavy pressure. The quartz comes into the upper floor of the mill, and when dumped from the cars of fine quartz goes through the racks to the self-feeders, and the coarser to the ponderous rock-breakers where it is crushed to the requisite fineness. The rock being crushed in the mill at present comes from No. 8 tunnel, and is lowered to the mill through a long chute. The lower tunnel is on a level with the mill. A raise is now being put through between the two tunnels and as soon as this work is accomplished the quartz will be lowered through the shaft to the lower tunnel and conveyed out to the mill in cars. In the course of another year the works on the hill will probably all be removed to the lower level, a move which will greatly benefit Sierra City. To a person interested in mining, a visit to the Sierra Buttes mine is a great treat. It is one of the largest in the State, and the management has been reduced to a science.

A VISIT TO THE MARGUERITE MINE.—Last Saturday a *Tribune* reporter paid a visit so the Marguerite mine, and through the kindness of superintendent Myers, passed two or three hours very pleasantly and profitably in inspecting the new machinery and receiving information as to its workings. Unfortunately, just as everything was in shape above ground to raise the water out of the mine, the main pump gave way in one of its parts and the work of pumping out the lower levels had to be abandoned for the present. At the time of our visit there everything was being raised out of the mine with the exception of a pump on the upper level, which will be kept there to hold the water at that point until a new pump can be received from the foundry. The latter was to be ordered immediately and as soon as it can be built will be shipped to the mine. Superintendent Myers now thinks that he will have the mine pumped out and everything in order to begin raising ore in three months at the furthest.

A GOOD PROSPECT.—The above mine is situated in Lady's canyon, about one mile west of the Colombo ground, and is owned by Messrs. Abbe & Flint. Two men are employed there at present running a tunnel that is already in 130 feet, and 300 feet below the surface. They expect to tap the vein in 75 or 100 feet further. Three ledges, varying from 3 to 5 feet in width, have been discovered on the ground. It is expected that these ledges will unite in the tunnel now being run. Two shafts were sunk to a depth of 25 feet each, and 3,000 feet apart on the vein, and splendid prospects obtained. The location of the mine is one of the best in this part of the country for economical working. Water, sufficient to run forty stamps the year around can be obtained very handy, with a pressure of 350 feet.

PHŒNIX.—The parties who are interested in starting up the Phœnix mine, at this place, are expected here in a very short time to inaugurate the work. The lower tunnel, which is now in 100 feet, will be run ahead to the vein, which it is supposed will be reached in about 600 feet further. This tunnel will tap the ledge some 500 feet below surface. The Phœnix mine has been worked upon in a prospective manner for a number of years, and it has long been regarded by people in this section as one of the most promising mines ever discovered in the district. It is located only a short distance from the business portion of town, and the fact that it is to be worked is hailed as good news by everybody.

PUSHING AHEAD.—The Burleigh drill has been placed in position at the Colombo mine, and everything is working nicely. The indications are said to be very favorable for encountering the ledge soon in the lower tunnel.

Siskiyou.

PICK AND PAN.—Yreka *Union*, April 3: The Centennial miners on the Klamath are washing good pay gravel. Pyle & Cook at Deadwood are erecting another arastra and also a concentrator for working sulphurets. Martin Olsen has purchased the water flowing in Boulder creek, a tributary of the North Fork of Salmon, of P. F. Dunphy, for mining purposes. Mr. Samuel Finley writes us that there is a scarcity of water in the Salmon district, and that miners on the gulches have had to suspend operations. Mr. Wm. McConnell has commenced hoisting gravel, in his Klamath river claim, with one derrick, and will have another one in operation in a few days. Hugo Miller of this city has deeded to Wm. Pullen one-eighth of the Empire Bar mine, situated on Klamath river, a short distance below Honolulu. John Neal, Wm. Weakly, H. F. Kols and John Barton have recorded the location of 40 acres of placer mining ground on Klamath river, six miles below Oak Bar. Messrs. Charles Baird, A. McDonald, Jas. Amos and Jas. Garrett have located a gold-bearing ledge on Methodist creek, this county, only a few miles from New River City. It will be known as the Cleveland. Capt. J. D. Potts, J. W. Loomis, A. J. Loomis and Harry Loomis, all of Red Bluff, have located 80 acres of placer ground on McAdams creek, adjoining the Steamboat mine, owned by George Smith and others. The new location will be known as the Red Bluff. John Quigley, Sr., W. H. Quigley, Thomas Quigley, E. S. Quigley, John Quigley, Jr., and William Doggett have located on the north side of Klamath river, in Oak Bar mining district, 175 acres of placer mining ground, to be known as the Horseshoe Bar mine.

Trinity.

COMING AND GOING.—Trinity *Journal*, April 4: There are a great many men going to the mines at New River, and a few are coming out. Seven reached here this week on the return trip. Of that number, two had been in there two or three weeks, two were there two days and three turned back before reaching the mines. The latter were looking for work and went no further when informed that there was no chance to obtain employment. Among the others opinion was divided; one acknowledged the district promising but too young; two thought the prospects excellent, but that it was too early in the season to enter on regular prospecting; the other was disposed to condemn everything he saw or heard. Referring to this latter opinion in the presence of an old pioneer, he curtly replied: "Oh, that is the old thing. When I came to Trinity in 1850, I met a great many leaving this section who condemned the whole country, said the mines would not pay, and those which had paid were worked out." Mines here have been worked successfully from that day to the present, and to-day Trinity presents a better field for mining investment than any other section on the Pacific Slope. So it is with many new districts which ultimately prove of great and lasting value. Discontent is no small portion of the make-up of humanity; some people are never satisfied and will not look at anything but the dark side. A great obstacle to new mining districts is also found in the fact that a considerable proportion of the men who follow mining excitements go into a new camp and when they get there have no idea what they went for. Then they growl and complain. We have faith in New River.

QUARTZ ON HAY FORK.—A correspondent kindly furnishes us the following items regarding quartz prospects in the Hay Fork region: "As quartz is all the excitement in Trinity now-a-days, I thought I would say a word for Hay Fork. Within the last few months considerable prospecting has been done in this vicinity for quartz and with flattering success. The last find was by Ed. Newman and Dan Colbert, near Newman's ranch. Charley Farmer & Co. have a good paying ledge opposite the mouth of Big Creek. J. R. Vogdes is prospecting a well-defined ledge on Big Creek. Deidrick & Parlin have struck good rock on Kingsberry gulch. Carter & Graham have good well-defined ledges in the same vicinity. Good rock has been brought in from South Fork near Mr. Scott's. Considering indications we think we can come up with or beat New River. Have just heard that Walter James has struck a good ledge on Carrier gulch.

Tuolumne.

NEW MILL.—Tuolumne *Independent*, April 3: The new mill of Lang & Shaw, on the Kanaka mine at Groveland, is in operation and running smoothly. Everything about the mine and mill look encouraging and prosperous. They have one of Schofield's concentrators in operation to save the sulphurets, in which the rock abounds. Considerable very rich ore is on the dump, which awaits more water so that the mill can be run regularly. Mr. Hyde informs us that he has not sold the Hyde mine, and that he still owns it, rumors to the contrary notwithstanding. He has merely made arrangements to dispose of it some time in the future, on certain specified conditions being complied with. An engineer has been sent up to get the water out of the mine. Messrs. Shine and Oliver are again at work unloading their rich pocket at Brown's Flat. One day this week they took out $700.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, April 4: Cross-cut No. 3, west on the 2900 level, is now in 75 feet from the main lateral drift. The first ten feet, as has been heretofore remarked, amounts to nothing, being in the cast or hanging wall. Then commences the ore vein, which is well defined and will pay well under the stamps for a width of 40 or 45 feet. The rest of drift is in a sort of porphyry horse, with streaks of good ore, and the face of the drift still shows the same. It is a considerable distance to the west wall, giving room for improvement yet in that direction. On the 3000 level the main lateral drift north has been continued onward toward the Savage line, which is about 200 feet distant, and the face is in quartz and porphyry, the drift being run in the east or hanging wall of the vein. The two cross-cuts west, Nos. 2 and 3, which were recently started, had to be discontinued on account of insuffi-

cient air supply. Cross-cut No. 1 west will be started to-day, and for the reason just stated, work at the face of the lateral drift north will be suspended in order to give the air supply to the new cross-cut.

CON. CALIFORNIA AND VIRGINIA.—About 50 tons per day are being taken from the 1750 level on company account, the average assay value being about $20 per ton. A drift is being run to the southwest on this level toward the old Con. Virginia ground. The ground above, between the 1550 and 1200 levels, which is being worked under the Jones lease, is yielding about 50 tons per day, of the average assay value of about $30 per ton. The water is almost up to the 2000 level in the C. and C. shaft and is about at a standstill.

CHOLLAR.—On the 3000 level, cross-cut No. 1, west, at the Hale and Norcross south line, is in about 20 feet, and appears to be getting into vein matter. It is expected to cut the same ore vein as found in Hale and Norcross. West cross-cut No. 2, 100 feet farther south, is in about 300 feet, and cross-cut No. 3, 100 feet still farther south, will be started shortly. These cross-cuts west are all from the main lateral drift south, which is run in the east or hanging wall corresponding with the main lateral drift north in the Hale and Norcross on the same level.

YELLOW JACKET.—The whole upper portion of this mine is being extensively worked, from the 1150 level up to the sagebrush, or 200 level. It is principally low-grade ore, yet some spots and streaks of high-grade are occasionally met with, for instance at the 400 level. More men are employed at present in this mine than any other along the Comstock, yet it will take years to exhaust the immense amount of ore known to exist above the Sutro tunnel level.

KENTUCK.—The old upper workings still continue their regular yield of ore, principally low-grade, keeping the Rock Point mill steadily running. The 1350 level is being prospected through the Crown Point mine, but contrary to previous report, it yields nothing as yet, and only low-grade ore has been found in it thus far—none worth sending to mill.

OPHIR.—On the 1465 level the north lateral drift is progressing well through a favorable formation, and the same may be said of the south drift on the 1500 level, which is near the proximity of the old workings. The water from the old Mexican shaft is being slowly drained out through the 500 level.

SIERRA NEVADA.—The surface works are completed and were started into working operation yesterday. The repairs to the shaft and the drain tunnel are about completed, and operations on the 600 level will be resumed forthwith, taking out low-grade ore and prospecting for more and better deposits.

ALTA.—The main lateral drift north on the 950 level is out about 180 feet, with its face in favorable vein matter. Cross-cut No. 2 from this drift is now in about 40 feet, all the way in good-looking material. The water continues slowly rising and is above the 1250 station.

OVERMAN.—A winze is being sunk from the old Lambert tunnel to connect with an old tunnel 266 feet below in order to facilitate prospecting at that depth and test the merits of the low-grade ore existing there.

CROWN POINT.—The old upper workings, above the 1700 level, continue their good daily yield of low-grade ore, and the mills on the Carson river, having plenty of water reduce the ore as fast as they can get it.

GOULD AND CURRY.—On the 1600 level the lateral drift south is progressing at the rate of nearly 60 feet a week toward the Savage north line. The material is principally porphyry, with quartz and clay occasionally.

BULLION.—Prospecting in the croppings still progresses favorably, and the parties engaged in it have now secured the old Fairview shaft in furtherance of that object.

BELCHER.—Still yielding a considerable amount of low-grade ore, the leavings of bonanza days, which is taken to the surface through the Crown Point.

WOODVILLE.—The tributers working the 300 and 400 levels still find considerable quantities of good pay ore.

BEST AND BELCHER.—The north lateral drift on the 1000 level is running in porphyry and making good progress.

Castle Dome District.

THE NEW MINES.—*Silver State*, April 7: Encouraging reports continue to reach here from the new mines in Castle Dome district. Two of the the ledges discovered are over six feet wide, and there is a streak of ore, about two inches thick in one of them, that averages over $6,000 in silver to the ton. The owners are sacking a quantity of the ore to ship to Salt Lake.

Taylor District.

STRIKE.—Taylor *Reflex*, April 3: A body of wonderfully rich ore was struck in the Hayes ground Thursday, at a depth of 70 feet by Steve Seaman, Ross Humphrey and Chris. Ostigard, who have a lease on the ground for six months. Much of the ore will go between two and three thousand to the ton. The Hayes ground adjoins the Monitor on the south and is owned by James Fitzpatrick, John Verzan and George Willams. The lessees and owners of the mine are on the high road to fortune and no mistake.

Tuscarora District.

INDEPENDENCE.—*Times-Review*, April 3: Main drift south, on the 400-foot level, has been extended 27 feet; total, 1,146 feet. Cross-cut east, same level, in very hard rock. Progress two feet. Drift south, on the vein encountered in this cross-cut, has been extended three feet. There is no material improvement.

BELLE ISLE.—The usual progress has been made in the drift north from No. 1 cross-cut, 450-foot level. Have started a drift north on the west vein, 250-foot level. Upraise on the west vein, 260-foot level has been carried up 12 feet, encountering some good ore. Nothing special to note in the other workings.

NAVAJO.—Work was suspended a couple of days the past week, while the boilers were being cleared. On the 650 foot level, the south drift was extended 17 feet, and the east cross-cut the same distance. Good progress has been made in sinking the winze from the 350-foot level. The usual progress has been made in No. 2 east cross-cut. Upraise on the east vein has been extended seven and a half feet; total length 110 feet.

Red Canyon District.

AT WORK.—Carson *Free Lance*: Red Canyon is still alive. Seven or eight men have been steadily at work all winter in the various mines of that district with more or less encouragement. The discovery made in the War Horse, which was made in these columns a short time ago, grows more important every day. Gray & Carter are drifting on the ledge, which continues to increase in size and richness as they advance into the mountain. They now have over 3 feet of good milling ore and the ledge still bearing to the east instead of north, as was heretofore supposed. Some very fine prospects have recently been discovered in the southern extremity of the Red Canyon range of mountains, near Walker river. Two ledges of quartz, well sprinkled with free gold, have been discovered, and one of them prospected for a distance of over 3,000 feet along the surface, and by a series of twenty or more ditches and shafts varying from 5 to 50 feet deep. There are no facilities greater than a hand-mortar for reducing the ore and only a very small proportion of it will pay by this process. The owners advertise elsewhere for assistance. They hope to interest parties who will co-operate with them and determine what character of reduction works, if any, are justified. There is now almost sufficient ore in sight to warrant the erection of a small gold mill, and they are very anxious to get parties to go and look at the prospect. Altogether the mining outlook south of us is brighter than usual, and a revival may be expected at any time.

Reese River District.

THE UNION MINE.—Reese River *Reveille*, April 3: The shaft of the Union, after an idleness of 18 years, has been drained by the Manhattan Company. It is 200 feet deep and at the bottom a cross-cut running south has also been drained and it has been explored to a distance of 250 feet. At this point a cave prevents further progress until it is repaired. The impression is that this cross-cut was run 400 feet before the endeavor to find the famous Whitlatch ledge was given up. This cross-cut will be continued as soon as the shaft and cross-cut are in proper shape for working, and if the famous lost lode is found Austin will have another boom.

ARIZONA.

VEKOL MINES.—Cor. Arizona *Herald*, April 4th: This mine is situated thirty miles south of Casa Grande, in one of the numerous foot-hills that jot this desert; altitude about 2,500 feet and under the direct influence of the gulf current. The Vekol (Old Grandmother) was discovered in 1880 by J. D. Walker, and is owned by J. D. Walker & Bro. The ore is chiefly chloride. Development commenced in the following August. The silver product of two men the first day was $59. The ore is assorted at the mine, and the best is shipped East for reduction, averaging at least $300 per ton. There are more than 5,000 tons of second class ore which will average $50 per ton now on the dump. There is a ten-stamp mill here, but owing to a failure of the parties to comply with their contract the Walker Bros. have not received it. But we are told that the ore will not spoil, and that it is a safe investment as it now lies upon the dump. About forty men are employed, chiefly Mexicans and Indians. The quantity of ore appears unlimited. There is but little waste labor. The south extension is a continuation of the Vekol. We predict that on some future day this property will rank among the first in the Territory. The ore is abundant, the silver is in it and it is free milling.

TAILINGS.—Prescott *Courier*, April 3: The fine 10-stamp mill of the Peak Company, at Alexandra, in this county, is being fixed up for a long run on Peek tailings. Mr. W. C. Dawes has a lease of the mill and the right to work the tailing. He has had them assayed and sampled, has engaged a good mill man and will, undoubtedly, make money out of them. These tailings have been exposed to the weather for years and may yield their treasure freely. The mill is located in a splendid mining region, convenient to a great many ledges which contain gold as well as silver, so that there is great hope of a lasting boom in that section. Meeting Mr. Craigue on the street, yesterday, we questioned him concerning prospects at the Sterling mine. He was mineralogically happy and assured us that the old mine is looking first rate. His men are now driving a winze. The vein is very large and the ore carries sufficient gold to pay for fooling with it. The company will, ere long, have a 15-stamp mill crushing the ore. The Sterling is about 5 miles south of Prescott, in the pine timber. Robert Thompson, of Agua Fria district, 18 miles east of Prescott, came in Saturday last. He owns in the Mountain Chief mine, which is a good strong vein of silver bearing rock. It is not far from Lawler Bros'. fine mine. Under-Sheriff M. L. Lawler is in receipt of a letter from his friend E. G. Wager, of Humbug district, in which the writer states that the Humbug mill is doing well on silver ore and will very soon be set to work crushing gold rock. No new strikes are reported, but old ledges are yielding considerable rich ore. Mr. Smithline has returned from New Orleans. He told his brother miners that the Arizona mineral exhibit was chief. Miners of Humbug district are praying for somebody to come along and build a railroad. Returns from placer mines now being worked are very cheering. Tracy's placer, Hassayampa creek, is yielding plenty of coarse gold, so are the Lynx creek hydraulic and sluice diggings and the diggings near Walnut Grove and Wehver. Riggs & Co. have made a good cleanup, on the lower Hassayampa. Black Canon claims are rewarding those who are working them. Messrs. Sam Bright and Geo. E. Berry find trouble in getting to the bed-rock in their claims on Groom creek, but prospects which they get out of loose gravel are very encouraging. Mr. Joe Tappan, foreman of the Conger mine, arrived yesterday, and last evening told us that there is enough gold ore in sight to keep the mill running three months.

COLORADO.

WASHINGTON GULCH PLACERS.—Elk Mountain *Pilot*, April 2d: There is a rumor that considerable work will be done on the placer diggings up Washington Gulch this season. There has been some work done there for several years, and a little gold taken out, but the manner of working has been so crude that it has made but very little showing. We believe that with a capital of $10,000 expended in hydraulics, that the ground would pay handsomely, and be a most profitable investment. So long as it is divided up among men who are too poor to go to the expense to properly work the ground, there will never be much benefit derived from it, but if the different owners would put their claims together, form a company, and raise sufficient money to systematically work the gulch, we firmly believe it would pay handsomely. Over twenty years ago a large amount of gold was taken out, and we are inclined to believe that it was not all taken out by any means. A little work has been done in Redwell Basin all winter, and if there was a smelter here that required heavy lead ore, Redwell would attract no little attention, as the veins are large galena veins, and it will require a home market to use the ore that is found at present. Mr. Groesbeck, the foreman of the Augusta mine, was in town this week, and reports that at the crosscut from the shaft 230 feet, the ore is found even better than above, and carries more gold if anything.

JUNCTION CREEK GOLD.—Denver *Tribune-Republican*, April 2d: Our city has been in a fever of excitement to-day over more gold discoveries at the head of Junction Creek. Our miners have been in a state of excitement ever since the strike of a month ago, but on account of the snow no one was willing to tackle it until last week, when some miners were sent up there to look after some placer ground. The snow was off only on the southern slope, but the men commenced work, and in running a ditch about five feet deep, they struck some very rich dirt. About two dollars' worth of gold was shown here that had been washed out of six or eight pans. The gold strike is in everybody's mouth. A corporate company was formed to-day by thirteen of our best citizens to work the property. These gentlemen will put up sluices and make extensive preparations to work their property as soon as the snow will permit. A second company was formed this evening and parties have started for the head of Junction Creek to-night, so as to be the first in the morning to locate their land. The excitement is running so high that developments may be expected very fast from this on, although the snows in the La Platas will retard the progress to some extent.

IDAHO.

BAYHORSE.—Idaho *Messenger*, April 3: Johnny Spaulding and Jas. W. Hamilton came over from Bayhorse, last evening. Mr. H., we learn, is down from the Beardsley mine to make the last payment, to-day or to-morrow, of $40,000 on the bond on that property. This mine was bonded six months ago for $45,000, and in these six months it has produced enough ore to pay for the driving of 700 ft of new works and, also, to pay the entire bond. The mine has now more ore in place and is in better for shape working than it ever has been.

MONTANA.

ANACONDA HILL.—*Inter-Mountain*, April 2: A few years ago, before any big mines were opened on Anaconda hill, a professional mining "expert" told a reporter of this journal that there was no ore in "that vast porphyry dyke" and cast ridicule at a few men who were seen digging a prospect hole near its summit. That same barren porphyry dyke, however, produced over $4,000,000 last year from the Mountain View, Anaconda, St. Lawrence, Parrot and the various Parrot fractions. All last summer and winter it produced 1,200 tons of ore per day, and there is now more ore in sight than ever.

MOUNTAIN VIEW.—In the Mountain View explorations are active and ore is abundant. The face of the east drift from the 600 ft south crosscut shows 12 ft of high grade copper ore, from which crude shipments are regularly made. In the north vein drifting is actively progressing westward on a fine body of copper glance.

ANACONDA.—The Anaconda is maintaining a steady daily product of about 600 tons, which vast amount is regularly shipped to the smelter. This product comes from various parts of the mine from the 300 to the 800 ft levels inclusive and some of it is reduced without concentration. The matte shipments from the smelter are about 90 tons per day.

ALICE.—The condition of the Alice properties is not much changed since last report. The Cornish pump continues to give perfect satisfaction and saves the company about $50 per day or $18,000 per year. It is in contemplation to sink the shaft at once to the 1,000 ft station. It will take some time to tap the ledge after the sinking shall be finished as the assurance of a mining "expert" some years ago, that the vein would dip south from the 500-ft level, seems to have been based on imperfect scientific conclusions. Very little has been published about the ore on the 800-ft level, but its appearance is evidently encouraging. Good reports are received from the 300-ft level, from which some high grade ore, containing considerable native silver is being extracted. The Magna Charter ore product remains at about 70 tons daily of good milling quartz. The shaft is being enlarged and the Cornish pump mentioned before will soon be placed in position.

LA PLATA.—The La Plata, under the supervision of James A. Talbot, holds its own as an ore producer. The face of the 350 ft east drift shows three feet of 35 ounce ore upon which steady inroads are being made. The supply, however, is abundant and the stopes shows no signs of exhaustion. The output is being worked at the Silver Bow mill.

ORPHAN GIRL.—The Orphan Girl continues to yield from the upper level about 30 tons daily of $30 ore. The main shaft is now completed to the 300 ft station and drifting for the bonanza shoot will at once begin.

BARNARD'S MINES.—Wayne Barnard, who recently returned from the east, has started up his Missouri gulch placer mine, and will probably resume operations on the Andy Johnson and other well-known properties in which he is interested. The Poser is being vigorously worked under lease and producing plenty of ore.

GENERAL NOTES.—The Bummer and Occidental, two promising prospects near the Big Butte, owned by McDermott, Leggatt & Co., have been recently leased and bonded to Sutherland & Co., for $50,000. The Gem copper and silver property is to be actively worked the coming season. The Montana smelter is in full blast on ore from the Colusa and other copper properties of the company. The Clear Grit is producing daily from 20 to 25 tons of 40 ounce ore, carrying some copper. The bullion shipments to-day were Moulton, 8 bars; Alice, 6 bars; Old Lexington, 1 bar. Total valuation, $18,500. The owners of the Germania are preparing to begin the exploration of that property. The Stevens is looking well on the 200-ft level and making regular ore shipments to the Silver Bow mill.

NEW MEXICO.

BULLION.—Silver City *Enterprise*, April 3: The Mimbres mill has been closed down for repairs. It started up again this week. During the past 60 days $53,000 in bullion and $3,000 in concentrates has been shipped from this mill. An important strike of horn and native silver is reported from the Cooncy mine. The body is said to be extensive and very rich, and promises to be an important feature of the mine, which already takes the lead as a producer of the precious metals in this section. Ore shipments will soon begin from the Silver King mine, at Bald mountain, which is being worked by Mr. Lewis and others under lease. A report from the Mogollons to effect that a mill and concentrating works will shortly be erected at Alma is the latest. About $50,000 worth of ore has been taken from the Rose mine, and is now sacked and ready for shipment. Work was commenced on the Rose less than four weeks ago, and all of this large amount of ore has been taken out since that time. There was 110 miners thrown out of employment at Lake Valley on Tuesday night. The superintendent posted a notice advising the men to seek employment elsewhere, as the date for again resuming work is very indefinite. Many of the miners have gone to Colorado, others have sought work at Georgetown and adjacent camps throughout the Territory. M. W. Stone has made a location on the south end of the Burro claim, at Fleming, on which some very fine mineral has been found, but as we understand, not in place. Mr. Stone and partner are prospecting the ground carefully, and it is believed that the ledge will be uncovered before any great depth is attained. Jack Sherwood has staked and started out no less than 7 prospectors, during the past month. Jack has a "prospecting" stake set aside which he intends expending upon experienced prospectors, who, if they are fortunate enough to "strike it" will do the fair thing by their benefactor. The richest carload of ore ever shipped from the Old Man mine was sent off this week. It was taken from the recent strike made in the west tunnel. The ore is of that characteristic rich horn silver kind for which the Old Man has become noted throughout the mining world. The body shows no sign of diminishing but seems to increase in extent, and may yet turn out to be a bonanza for the company and county. Lone Mountain, after nearly two years of idleness, so far as mining is concerned, is again coming to the front and entirely on its merits as a mineral producing camp.

OREGON.

PLACERS.—Jacksonville *Times*, April 3d: More prospecting than ever is promised this season. Some prospectors are in the Evans creek district and speak well of a number of ledges there. Jackson county still has some of the best mines on the coast. All that is necessary to prove this is capital. Henry Klippel, J. C. McCully, Jas. Lawrence and Adam Ruhl have gone to Beaver creek and vicinity on a prospecting tour. Simmons, Ennis & Co., of Josephine county are about putting in a huge flume, and expect to put their mammoth enterprise in working shape this year. E. J. Curtis of the Siskiyou mountain has been to the New River Cal. mines, and returned home last week. He is not favorably impressed with them, though a great many others are. Geo. H. Chick of Portland paid the Schumpf ledge in Willow Springs precinct a visit during the week. He speaks in flattering terms of the future of that mine, and thinks it can be sold for a round sum. Enoch Gale of Grave creek was in town the forepart of the week. He informed us that most of the miners of that section will not be able to clean up, owing to the scarcity of water, and consequently their season's work will not amount to much. Chris. Kretzer, who is mining on one of the gulches above Jackson creek, recently found a good-sized nugget of gold and silver. Strange as it may appear, the larger per cent of it is silver. A large piece of the same component parts was found in that neighborhood some time ago. Considerable excitement is raging over the discovery of a large amount of quartz, near the head of Gall's creek, which is supposed to be rich with silver. An assay of some of the ore made by J. H. Fisk of Portland shows it to be of a very promising character.

UTAH.

REVIEW.—Salt Lake *Tribune*, April 3: The weather continues fine, with every indication of an unusually early spring. But the movements of the metals continue light. The shipments out from this city for the week ending Saturday, March 28th, inclusive, were as follows: 113 cars or 2,881,643 lbs. The receipts of bullion in this city for the first three months of the present year, exclusive of ore receipts, and of operations making no current reports, were as follows: January, $378,644.56; February, $237,536.78; March, $273,771.69; Total $889,953.03. The receipts of this city for the week ending April 1st, inclusive, were: Of bullion, $72,519.25; of ore, $12,890; total, $85,409.25. For the week previous the receipts $44,798.44 of bullion, and $5,275 of ore. Reporters of the *Tribune* hear of some shipments by the Horn Silver, but as the rumors of the amounts differ and are certainly in some cases exaggerated, it will be best to wait the regular and authorized statement before attempting to give figures. Ontario shipments for the week were 48 bars of bullion, valued at $35,209.25, bringing the total shipments for the three months of this year up to $434,164.77. Silver Reef sent up during the week two bars of silver, $3,010, from the Christy; and two bars from the Stormont, $3,100, a total of $6,110. The product of the Hanauer smelter for the week was 12 cars of bullion, $31,200. Ore receipts were: From the Honerine, Utah, two lots, $8,060; from the Crescent, $1,960; from Wood River, $2,870.

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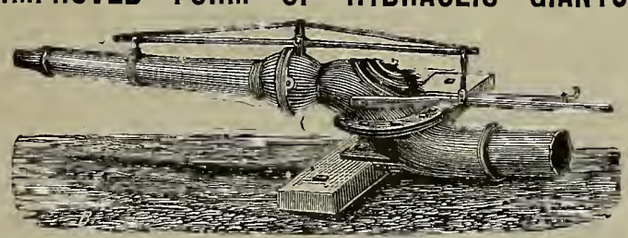

The above cut illustrates the IMPROVED FORM OF HYDRAULIC GIANTS, which we manufacture. All other styles are infringements upon this form, and a judgment standa of record to that effect, under the decision of Judge Sawyer of the U. S. Circuit Court in the matter of Hendy and Fisher vs. R. Hoskin et als.
☞PRICES furnished upon application to

JOSHUA HENDY MACHINE WORKS,
39 to 51 Fremont St., San Francisco, Cal.

Chicago Prices Beaten!
ESTABLISHED 1860.
S. F. PIONEER SCREEN WORKS,
32 Fremont St., San Francisco.
J. W. QUICK, Prop'r.

Sheet Metals of all kinds perforated for Flour and Rice Mills, Grain and Malt Driers, Furnaces, Chess, Cement and Smut Mills, Separators, Revolving and Shot Screens, Stamp Batteries, and all kinds of Mining and Milling Machinery. Inventor and manufacturer of the Celebrated Slot Cut and Slot Punched Screens Mining Screens a Specialty, from No. 1 to 15 (fine).
☞Orders Promptly Executed.

THE GIANT POWDER COMPANY

Manufacture Three Kinds of Powder, which are acknowledged by all the Great Chemists of the World as
The Safest and Strongest High Explosives in the Market.

GIANT POWDER or DYNAMITE,
Of Different Strengthe as Required.

NOBEL'S "EXPLOSIVE GELATINE," which contains 94 per cent of Nitro-Glycerine, and GELATINE-DYNAMITE, Stronger than Dynamite and even Safer in Handling.

JUDSON POWDER IMPROVED.

FOR RAILROADS AND LAND CLEARING. Is from three to four times stronger than ordinary Blasting Powder, and is used by all the Railroads and Gravel Claims, as it breaks more ground, pulverizes better and saves time and money. It is as dry as the ordinary Blasting Powder and runs as freely.

BANDMANN, NIELSEN & CO.,

CAPS and FUSE for Sale. GENERAL AGENTS, SAN FRANCISCO, CAL.

THE CALIFORNIA POWDER WORKS.

MANUFACTURERS OF

Sporting, Cannon, Mining, Blasting and

HERCULES POWDER

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

No. 1 (XX) is the Strongest Explosive Known.
No. 2 is superior to any powder of that grade.

PATENTED IN THE UNITED STATES PATENT OFFICE.

ORDERS RECEIVED FOR HERCULES CAPS AND FUSE.

JOHN F. LOHSE, SEC'Y.

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THE CONSUMERS' COMPANY.

VULCAN B B AND AJAX.

The Best LOW GRADE EXPLOSIVES in the Market.
☞SUPERIOR TO BLACK OR JUDSON POWDER.☜

Vulcan Nos. 1, 2 and 3,

The Best NITRO-GLYCERINE POWDERS Manufactured.

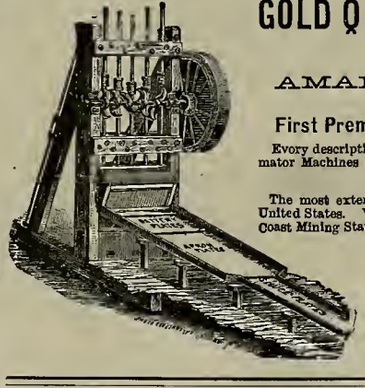
SPECIAL INDUCEMENTS IN PRICES.

AJAX and VULCAN B B POWDERS are Unequaled for Bank Blasting and Railroad Work.

Caps and Fuse of all Grades at Bottom Rates.

VULCAN POWDER CO.,

218 California Street, San Francisco, Cal.



GOLD QUARTZ and PLACER MINERS

Silver Plated
AMALGAMATING PLATES,
For Saving Gold
First Premium Awarded at Mechanics' Fair, 1884.

Every description of plates for Quartz Mills and Wet or Dry Placer Amalgamator Machines made to order, corrugated or plain.
OVER 2,000 ORDERS FILLED.

The most extensive and successful manufacturer of these plates in the United States. Will fill orders for delivery in Rocky Mountain and Pacific Coast Mining States at lower prices than any other manufacturer.

Old Mining Plates Replated. Old Plates bought or gold separated for low percentage of result.

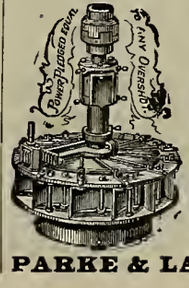
SEND FOR PRICE LIST.

SAN FRANCISCO PLATING WORKS,
653 & 655 Mission St., San Francisco Cal
E. G. DENNISTON, Proprietor.

JAS. LEFFEL'S TURBINE WATER WHEEL,

The "Old Reliable,"

With Important Improvements, making it the



MOST PERFECT TURBINE NOW IN USE,

Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.

Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address

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WE CARRY IN STORE, DENVER:
Boston Belting Co.'s Rubber Belting, Abendroth & Root's Spiral Pipe, Iron Wheel-barrows, Ore Cars, and Buckets, Hoisting Engines, Etc., Etc.

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MINING MACHINERY,
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WE KEEP IN STORE, DENVER:
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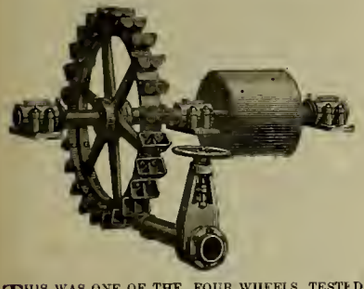
MACHINERY for SYSTEMATIC MILLING, SMELTING, and CONCENTRATION of ORES.

PUMPING ENGINES —AND— MACHINERY, CORNISH PUMPS.

HOISTING ENGINES, WIRE ROPE TRAMWAYS.

GENERAL OFFICE AND WORKS: Fulton and Union Streets, Chicago, Ill.
NEW YORK OFFICE: Room 43, No. 2 Wall Street.
WAREHOUSE AND BRANCH OFFICE: No. 423 Blake Street, Denver, Colorado.
MEXICO OFFICE: No. 11 Calle de Juarez, Chihuahua, Mexico.

PELTON'S WATER WHEEL.



THIS WAS ONE OF THE FOUR WHEELS TESTED by the Idaho Company at Grass Valley, Cal., and gave 90 2 per cent., distancing all competitors. Send for Circulars and guaranteed estimates.

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Nevada City, Nevada Co., Cal.
AGENTS—PARKE & LACY, 21 and 23 Fremont Street San Francisco, Cal.

GOLD MEDAL AWARDED
—AT—
Mechanics' Fair, 1883 & 1884
—FOR—
Automatic Cut-Off Engine.
SILVER MEDAL AWARDED
—1883—
For Best Hoisting Engine and Boiler Combined.

W. H. OHMEN,
Machine and Engine Works
109 & 111 Beale St.
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"CLAYTON" IMPROVED MINING PUMPS

ROCK DRILLS

AIR COMPRESSORS
For CATALOGUES, ESTIMATES, Etc Address,
CLAYTON STEAM PUMP WORKS
45 & 47 York St., BROOKLYN, N.Y.
(Near Approach to New York & Brooklyn Bridge)

San Francisco Cordage Factory.
Established 1856.
Constantly on hand a full assortment of Manila Rope, Sisa Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.
Extra sizes and lengths made to order on short notice.
TUBBS & CO.
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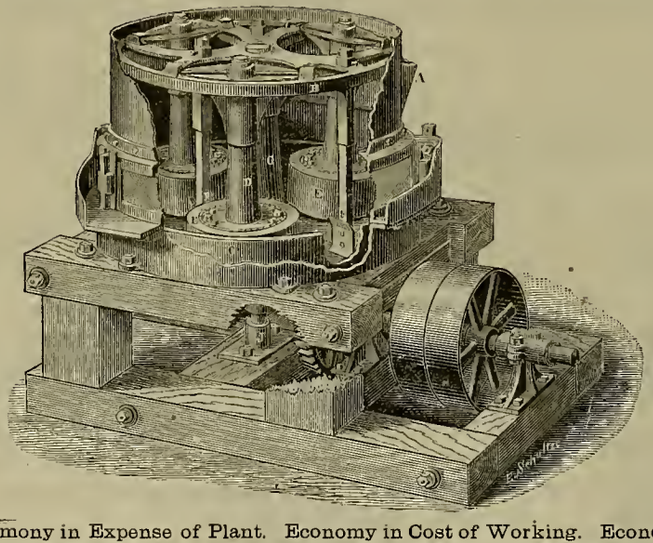
F. A. HUNTINGTON'S
CENTRIFUGAL ROLLER QUARTZ MILL.



Economy in Expense of Plant. Economy in Cost of Working. Economy in Saving Gold. Economy in Transportation of Machinery. Economy in Cost of Erection of Mill at Mine. Economy in Time Required to Establish Plant (one day only being consumed).

The Huntington Mill has passed entirely through the experimental stage. Two years of continuous use at a number of mines in California has enabled the inventor to perfect and improve the machinery until he feels justified in assuring the public that he has reached THE ABSOLUTE in the construction of a perfect Quartz Mill.

ROCK BREAKERS, CONCENTRATORS
.....AND.....
Mining Machinery
Of Every Description. Send for Circulars.
.....MANUFACTURED BY.....
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FRASER & CHALMERS,
Cor. Fulton and Union Sts., Chicago, Ills.

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IS ACKNOWLEDGED BY USERS AS THE BEST in the world. Unlike all other Packings, the Jenkins Standard Packing can be made any thickness desired in a joint by placing two or as many thicknesses together as desired, and following up joint, it vulcanizes in place and becomes a metal of itself (it is frequently called Jenkins Metal), and will last for years, as it does not rot or burn out. Avoid all imitations, as a good article is always subject to cheap imitations. The genuine has stamped on every sheet "Jenkins Standard Packing," and is for sale by the Trade generally.

For Sale by DUNHAM, CARRIGAN & CO., San Francisco, Cal.
Manufactured only by JENKINS BROS., 71 John St., New York.

DEWEY & CO. { 252 MARKET ST., S. F. / Elevator, 12 Front St. } PATENT AGENTS.

This paper is printed with Ink Manufactured by Charles Eneu Johnson & Co., 500 South 10th St., Philadelphia. Branch Offices 47 Rose St., New York, and 40 La Salle St., Chicago. Agent for the Pacific Coast—Joseph H. Dorety, 529 Commercial St. S. F

Metallurgy and Ores.

THOMAS PRICE,
Chemical Laboratory, Assay Office,
BULLION ROOMS & ORE FLOORS,
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GOLD AND SILVER REFINERY
And Assay Office.
Highest Prices Paid for
GOLD, SILVER and LEAD ORES
AND SULPHURETS.
....MANUFACTURERS OF....
BLUESTONE,
LEAD PIPE,
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ASSAYING TAUGHT.
Personal attention insures Correct Returns.

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METALLURGICAL WORKS,
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Corner of Leidesdorff Street, - - SAN FRANCISCO
Ores Sampled and Assayed, and Tests made by my Process.
Assaying and Analysis of Ores, Minerals and Waters.
Mines Examined and Reported on.
Practical Instruction given in Treating Ores by improved processes.
G. KUSTEL & CO.,
Mining Engineers and Metallurgists.

JOHN TAYLOR & CO.,
IMPORTERS AND DEALERS IN
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MINE AND MILL SUPPLIES,
CHEMICAL APPARATUS AND CHEMICALS, DRUGGISTS' GLASSWARE AND SUNDRIES, ETC.
114-118 Pine Street, - San Francisco.
We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.
Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we are confident from our experience we can well suit the demand for these goods, both as to quality and price. Our New Illustrated Catalogue, with prices, will be sent on application.
Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England.
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Nevada Metallurgical Works.
NO. 23 STEVENSON STREET,
Near First and Market Streets, S. F.
C. A. LUCKHARDT, Manager. ESTABLISHED 1869.
Ores worked by any Process.
Ores Sampled.
Assaying in all its Branches.
Analyses of Ores, Minerals, Waters, etc.
Working Tests (practical) Made.
Plans and Specifications furnished for the most suitable Process for Working Ores.
Special attention paid to Examinations of Mines; Plans and Reports furnished.
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Mining Engineers and Metallurgists.

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ORES SAMPLED, TESTED, ASSAYED.

THE HARMON SEMINARY,
Berkeley, Cal.
A BOARDING AND DAY SCHOOL FOR YOUNG LADIES.
Pupils taken at any time.
For Catalogue or other informat on, address:
THE MISSES HARMON, Berkeley, Cal.
Or E. J. WICKSON, 414 Clay St., S. F.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents by DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 262 Market St., S. F.

FOR WEEK ENDING MARCH 31, 1885.

314,922.—OIL BURNER—E. A. Edwards, Los Angeles, Cal.

314 923.—FLAME DEFLECTOR FOR VAPOR BURNERS—E. A. Edwards, Los Angeles, Cal.

314,659.—ROWLOCK—O. B. Fenner, Oakland.

314,580.—WHEEL GUARD FOR RAILWAY CARS—Jos. Jacobs, S. F.

314,677.—FLOOR OR AREA COVERING—P. H. Jackson, S. F.

314,689.—HYDRAULIC ENGINE—L. N. Knight, Sutter Creek, Cal.

314,944.—SAW SET—W. Kopf, Santa Rosa.

314,873.—CULTIVATOR—L. E. A. Palmer, San Bernardino, Cal.

314,716.—LIFTING JACK—Thos. Phares, Eureka, Cal.

314,878.—CENTRIFUGAL PUMP—John Richards, S. F.

314,979.—BRUSH CUTTING MACHINE—O. R. Rufus, Sonoma, Cal.

314 617.—WATER CLOSET—Wm. Smith, S. F.

314,631.—SUPPORT FOR CARRIAGE TOPS—I. L. Unistead, Ione, Cal.

314,632.—ATTACHMENT FOR OPERATING GATES—Wm. T. Vann, Salem, Ogn.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SAW-SET. — William Kopf, Santa Rosa. No. 314,944. Dated March 31, 1885. This consists in a framework provided with a reciprocating hammer adapted to operate against a suitable die; in a peculiarly adjustable bench or rest, secured to the frame and adapted to receive and support the blade of the saw at any angle and at any distance from the die, and in an adjustable guide for the different lengths of teeth. It further consists in the details of construction by which the bench or rest is adjusted to or from the die or plane of the hammer, and up or down to support the blade at any angle with the horizontal plane of the die.

LIFTING-JACK.—Thos. Phares, Eureka, Humboldt Co., Cal. No. 314,716. Dated March 31, 1885. This new lifting-jack has a novel oscillating head, which is provided with two alternately-acting pawls. These are adapted to raise a rack-bar so as to elevate anything which may be placed upon the top plate. In combination with this mechanism is provided a friction-clamp, operated by an eccentric or cam, so as to press against the rack-bar when desired, and a means for releasing the pawls, so that be rack-bar and its load may be lowered at will by the use of the friction clamp, while the pawls are held out of contact with the bar.

FLOORS AND AREA COVERINGS.—Peter H. Jackson, S. F. No. 314,677. Dated March 31, 1885. This invention relates to certain improvements on fire proof floors, pavements or area coverings; and it consists of a surface of artificial stone or concrete, either with or without illumiuating tiles set thereon, together with corrugated metal plates, strengthening bars or ridges in connection with said plates and metallic ties for the same.

Mining Share Market.

The principal interest this week was centered in Hale & Norcross, and the stock has changed prices in a marked degree. This is supposed to be due, of course, to the deep ore development now being made at the 2400 and 3000 levels of the Hale & Norcross, the only mine now working below the surface of the flood, so to speak. Both portions of the great lode to the north and south are submerged so far as their lower levels are concerned, and the hot water flood allowed to have full unrestrained possession. And it would have been the same with the middle mines had it not been for the small streak of good ore found on the 2600 level of the Hale & Norcross, which has been steadily followed down to the 3000 level, where its true merits will soon be ascertained. This could not have been done were it not for the powerful and capacious hydraulic pumps of the Combination shaft which easily keep the lowest levels free of water, notwithstanding the flooded mines of the north and south.

The Virginia *Enterprise* says that active work is being done in the extraction of low-grade ore from the extensive bodies known to exist in the upper levels, and hundreds of miners are thus employed, to say nothing of the mills. This work is almost exclusively confined to the Gold Hill section, but work is to be resumed in the old Chollar croppings before long; also, in the Cedar Hill. At the Monte Cristo mine, the Lady Bryan, in Flowery District, considerable ore is being extracted from the surface workings and milled at a fair profit. Various other outside mines and locations are being worked or prospected, both to the eastward and westward of the Comstock range, and more men are employed or engaged in this chief industry than people generally are aware of,

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'NT. SALE.	SECRETARY.	PLACE OF BUSINESS
Andes S M Co	Nevada	26	25	Mar 2	Apr 8	Apr 30	B Burris	309 Montgomery st
Alaska M and M Co	Alaska	10	35	Apr 3	May 4	May 20	T J Hay	306 Pine st
Belmont M Co	Nevada	39	15	Feb 11	Mar 21	Apr 13	J W Pew	310 Pine st
Con Amador M Co	California	9	50	Mar 16	Apr 15	May 1	F B Lathani	408 California st
Daisy Cement M Co	California	3	2	Mar 28	May 5	May 27	C J Collins	512 Montgomery st
Excelsior W and M Co	California	7	50	Sept 2	Apr 8	Apr 28	W J Stewart	215 Sansome st
Golden Channel M Co	California	2	01	Feb 12	Mar 26	Apr 21	A B Paul	328 Montgomery st
Hale & Norcross M Co	Nevada	84	50	Mar 2	Apr 7	Apr 28	E B Holmes	309 Montgomery st
Horseshoe M Co	California	4	2	Mar 9	Apr 11	Apr 27	A Berg	Grass Valley
Indian Spring Drift M Co	California	5	03	Feb 19	Mar 23	Apr 23	A B Paul	328 Montgomery st
Julia Con M Co	Nevada	23	10	Apr 6	May 13	June 5	J Stedfeldt	412 California st
Mayflower Gravel M Co	California	29	10	Mar 26	May 5	May 29	J Morfido	328 Montgomery st
Mexican M Co	Nevada	29	25	Feb 24	Mar 31	Apr 21	C E Elliott	309 Montgomery st
Noche Buena M Co	Mexico	1	11	Mar 27	May 8	May 29	C Hart	106 Battery st
North Star G M Co	California	1,50	Mar 5	Apr 9	May 1	D A Jeonings	401 California st
Ophir M Co	Nevada	49	50	Feb 18	Mar 24	Apr 13	E B Holmes	309 Montgomery st
Pittsburg M Co	California	19	5	Feb 28	Apr 25	May 15	C J Bandmann	210 Front st
Rainbow M Co	Cal-forda	13	15	Mar 14	Apr 21	May 20	P F Marhardt	307 Montgomery st
Rocky Bar M Co	California	8	25	Feb 18	Mar 24	Apr 13	G W Hill	Grass Valley
Sulphur Bank Q M Co	California	3	50	Feb 25	Apr 16	Jun 1	L Hermann	220 Sansome st
Sierra Nevada M Co	Nevada	81	25	Feb 18	Mar 25	Apr 14	E S Parker	309 Montgomery st
Summers Con M Co	California	3	05	Mar 17	Apr 20	May 12	F E Luty	330 Pine st
Tower Con M Co	California	2	10	Mar 11	Apr 15	May 5	G W Sassions	309 Montgomery st
Union Con MCo	Nevada	29	25	Feb 16	Mar 24	Apr 14	J M Bullington	309 California st
Yosemite M Co	California	2	21	Feb 7	Mar 16	Apr 21	J Weisheim	Grass Valley

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Champion M Co	California	T Wetzel	522 Montgomery st	Annual	Apr 10
Marshall M Co	California	A L Perkins	320 Pine st	Annual	Apr 15
Tioga Con M Co	California	G W Sessions	309 Montgomery st	Annual	April 13

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Kossuth M Co	Nevada	C K Sturtevant	328 Montgomery st	06	Mar 16
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Feb 13
Plymouth Con G M Co		W Van Norden, Pres.	23 Nassau st, N Y	50	Apr 6
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Feb 16

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE. Mar 26-Apr 1	Portland. Rain	Temp.	Wind.	Weather.	Red Bluff. Rain	Temp.	Wind.	Weather.	Sacramento. Rain	Temp.	Wind	Weather.	S. Francisco. Rain	Temp.	Wind.	Weather.	Los Angeles. Rain	Temp.	Wind.	Weather.	San Diego. Rain	Temp.	Wind.	Weather.
Thursday	.00	61	NW	Cl.	.22	64	S	Cy.	.00	66	S	Fr.	.—	58	NW	Cl.	.06	71	S	Cl.	.00	65	NW	Cl.
Friday	.00	61	NW	Cl.	.00	63	S	Fr.	.00	56	NW	Cy.	.01	53	NW	Cy.	.00	63	W	Cl.	.00	65	W	Cl.
Saturday	.00	62	N	Cl.	.00	61	S	Cy.	.01	—	—	—	.04	53	S W	Cy.	.00	67	W	Cl.	.—	63	W	Fr.
Sunday	.—	56	S	Cy.	.00	64	S	Cy.	.01	64	S W	Cy.	.02	57	S W	Cy.	.00	5	W	Cy.	.05	62	W	Cy.
Monday	.01	50	N W	Fr.	.00	64	S	Cy.	.00	64	S E	Cl.	.—	60	N E	Fr.	.—	68	S	Cy.	.00	80	S W	Cl.
Tuesday	.00	60	NW	Cl.	.00	71	S	Cy.	.07	65	N	Cy.	1.16	62	S W		.18	67	S E	Cy.	.07	57	N E	Cy.
Wednesday	.30	61	NW	Cl.	.02	74	N	Cl.	.41	70	N	Fr.	1.20	68	E	Cy.	.03	73	E	Cy.	.	79	NW	Fr.
Totals	.01				.24				53				2.43				.24				12			

EXPLANATION.—Cl, for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature and weather at 12:00 M. (Pacific Standard time), with amount of rainfall in the preceding 24 hours.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Mar. 19.		WEEK ENDING Mar. 26.		WEEK ENDING Apr. 2.		WEEK ENDING Apr. 9.	
Alpha	.60	.60	.65	.75	.80	.25	1.50
Alta	.25	.30	.15	.25	.25	.30	.40
Andes	.10	.05	.05	.05	.35	.40
Argenta							
Belcher	.75	.75	.80	.75	.85	.90	1.10
Belding							
Best & Belcher	1.05	1.10	.90	1.05	1.05	1.15	1.50	1.95
Bullion	.20		.25		.25	.35	.60
Bonanza King							
Belle Isle	.15						.15
Bodie Con	2.10	2.30	2.10	2.30	1.95	2.20	1.55	1.75
Bodie Con				.05	.05	.10		.15
Bodie Tunnel						.30		
Bulwer	.30	.35	.40	.30	.35	.35	.40
California	.30	.45	.35	.40	.40	.45	.65	.95
Challenge								.25
Champion								
Chollar	1.85	1.95	1.65	2.00	2.05	2.15	2.70	3.30
Confidence		.70	.75	.80		.80		
Con. Imperial								
Con. Virginia	.30	.45	.35	.40	.40	.45	.65	.95
Con. Pacific		1.00						.65
Crown Point	.70	.80		.75	.80	1.00	1.00	1.25
Day								
Eureka Con	4.10	5.00			3.35	4.00	4.50	4.60
Eureka Tunnel								
Exchequer				.25		.25	.30	.35
Grand Prize								
Gould & Curry	.75	.85	.70	.80	.85	.95	1.00	1.90
Goodshaw								
Hale & Norcross	5.12	5.75	4.85	6.00	5 50	6 12½	5.63	10.50
Holmes		5.00			4.75	4.80		4.75
Independence								
Julia								
Justice		.15			.15	.20		.30
Martin White		.50		.65	.60	.65		
Mono	1.25	1.35	1.20	1.30	1.05	1.15	1.10	1.20
Mexican	.20	.35	.15	.25	.45	.50	.70	.80
Mt. Diablo	3.75	3.90		3.85			3.00	3.95
Northern Belle								
Navajo	1.05	1.10	1.10	1.15	1.05	1.10	1.05	1.10
North Belle Isle		.20		.15				.15
Occidental		.95		.85			1.25	2.10
Ophir	.10	.20	.55	.60	.50	.55	.70	.80
Overman		.20			.15	.20	.25	.40
Potosi	.80	.90	.75	.90	.90	.95	1.25	1.55
Pinal Con								
Savage	1.85	1.95	1.85	2.20	2 25	2.75	3.15	4.40
Seg. Belcher								
Sierra Nevada	.25	.40	.25	.50	.40	.55	.85	1.00
Silver Hill								.10
Silver King			3.25	3.75		3.40		3.70
Scorpion		.10		.10		.15		.20
Syndicate			.40	.45		.40	.45	.50
Tioga								
Union Con	.15	.30	.40	.45	.45	.50	.70	.85
Utah		.60					.70	1.10
Yellow Jacket	1.25	1.30	1.25	1.35	1.00	1.95	1.80	2.40

Bullion Shipments.

King, April 3, $8,087; Alhambra Mill, 5, $18,720; Barber's Mill, 5, $6,552; Alice, 5, $9,088; Silver Reef District (for March) $29,485; Honering, March 31, $4,000; Christy, 3r, $1,450; Ontario, 3r, $35,209; Christy, April 3, $1,650; Ontario, 3, $21,843; Hanauer, 3, $22,390; Martin, 3, $5,100; Queen of the Hills, 3, $7,300; Overland, 3, $1,200; Stormont, 5, $3,290; Queen of the Hills, 5, $2,400; From Butte, Montana, in March, $355,454.

YOUNG MEN (or Young Ladies) desiring a course in a thorough Business College, on favorable terms should communicate with this paper for further and reliable information.

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Apr. 9.

100 Andes.....50c
500 Alta.....60@65c
1200 Alpha.....1.30@1.45
300 Bodie Con.....1.60
1260 B. & Belcher...2.60@2.80
200 Bulwer.....35c
410 Bullion.....1.70
1750 Benton.....15c
1530 Chollar.....4.50@4.75
50 Confidence.....1.50
200 Challenge.....40c
300 Crown Point...1.85@1.90
2850 Con Va & Cal..1.10@1.05
750 Exchequer.....40@45c
825 Gould & Curry.2.05@2.85
920 Hale & Nor.....11.75@12
50 Holmes.....4.50
3150 Justice.....35@40c
250 M. White.....60c
1100 Mexican.....1.45@1.50
300 Navajo.....1.05
610 Occidental.....2.75
1740 Ophir.....1.50@1.60
120 Overman.....40c
75 Potosi.....2.05
1050 Sierra Nevada.....1.70@2

AFTERNOON SESSION.

1500 Savage.....5.37@61
650 Scorpion.....30c
50 Syndicate.....40c
200 Silver Hill.....10c
50 Utah.....2.05
700 Union.....1.60@1.70
100 Yellow Jacket.....2.35
55 Bodie.....2.20
550 Bulwer.....35c
200 Chollar.....1.95@2.00
2750 Con Va & Cal.....40c
100 Confidence.....75c
50 Crown Point.....75c
350 Gould & Curry.....80c
1570 Hale & Nor.....55c
150 Mexican.....15c
400 Mono.....1.20
50 Martin White.....65c
100 Navajo.....1.10
250 Ophir.....55@60c
50 Occidental.....85c
50 Potosi.....85c
210 Sierra Nevada.....45c
2250 Savage.....2.00@2.05
200 Silver King.....3.25
50 Scorpion.....10c

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Apr. 9, 1885.

ANTIMONY—Per pound	@	—
Hallett's	12½	@ —
Cookson's	13	@ —
BORAX—Refined	7	@ 8
IRON—Glengarnock ton	25 50	@ —
Eglinton, ton	23 50	@ —
American Soft, ton	27 00	@ —
Oregon Pig, ton		@ —
Clipper Cap, Nos. 1 & 2	26 00	@ —
Clipper G-p, Nos. 3 & 4	27 50	@ —
Clipper Gap, No. 5	26 00	@ —
Clay Lane White	26 00	@ —
Shotts, No. 1	26 00	@ —
STEEL—English, lb	17	@ 25
Black Diamond, ordinary sizes	13	@ —
Plow	6	@ 8
Machinery	10	@ 12
Sanderson Bros	13	@ —
COPPER—		
Baziers' sizes	—	@ 25
Fire-box sheets	28	@ —
Bolt	22	@ —
Yellow Metal	14	@ 15
Ingot	13	@ 14
LEAD—Pig	3½	@ 3¾
Bar	6	@ —
Pipe	7	@ —
Sheet	8	@ —
Shot, discount 10% on 500 bag	Drop, ₱ bag. 1	85 @ —
Buck, ₱ bag	2	05 @ —
Chilled, do	2	25 @ —
TIN PLATE—Oldcastle	5	25 @ 6 00
Charcoal	5	75 @ 6 75
Coke	5	25 @ 6 60
Roofing	6	25 @ 13 50
ZINC—German	9	@ 10
Sheet, 7x3 ft, 7 to 10 lb, less the cask	9	@ 10
QUICKSILVER—By the flask	33 50	
Flasks, new	1 05	@ —
Flasks, old	85	@ —
NEW YORK PRICES—		
California BORAX, refined	8	@ 8½
Pig Iron, American No. 1	17 50	@18 50
Quicksilver	45½	@ —
Lead	3 70	@ —
Copper	10½	@ —
Tin	17½	@ —
Bar Silver	1 06	@ —

MIKE SHINE and Dave Oliver returned from San Francisco last week. Their pocket panned out about $12,000. The gold was very fine, coining about $19.48 an ounce. The boys have gone to work again to take out more gold.—*Union Democrat.*

POCKET ALTITUDE BAROMETERS. Muller's Optical Depot, 135 Montgomery street.

Market Reports.

Lumber at Wholesale.

There is a fair trade in lumber, but no special changes in price. Quotations of cargo rates are as follows for redwood lumber, for delivery at San Francisco, Oakland, Alameda, Berkeley, Vallejo, Benicia, Port Costa, Martinez and Antioch:

ROUGH—No. 1 rough merchantable, $18; No. 2 (refuse) rough, $14; No. 1 rough boards (specified width, 10 inches and over), $19; No. 2 (refuse) do do do, $14; No. 1 rough lumber, surface one side, $21; No. 2 (refuse) do do do $18.

PICKETS—Rough square pickets, $12; rough pointed do, $14; fancy pointed do, $22.

HALF-INCH LUMBER—No. 1 ½-inch surfaced, board measure, $40; No. 2 do do do, $39; No. 3 do do do, $38; No. 4 (refuse) do do do, $32; No. 1 ½-inch battens, board measure, $40; No. 2 (refuse) do do do, $32; No. 1 ½-inch siding, 12 ft. and over, b m, $40; No. 2 (refuse) do do do $32; ½-inch siding, under 12 ft, $32.

RUSTIC—No. 1 Rustic, 1x10, 12 ft and over, $33; No. 2 do do do, $32; No. 3 do do do, $31; No. 4 Rustic, 1x10, $28; No. 5 (refuse) do do do, $21; No. 1 Rustic, 1x8, 12 ft and over, $31; No. 2 do do do, $30; No. 3 do do do, $29; No. 4 Rustic, 1x8, $26; No. 5 refuse) do do, $21.

CLEAR—No. 1 surfaced and rough clear, $32; No. 2 do do do, $31; No. 3 do do do, $30; No. 4 (refuse) do do do, $24; No. 1 surfaced and rough clear, 1x8 and 1x6, $30; No. 2, do do do, $29; No. 3 do do do, $28; No. 4 (refuse) do do do, $24.

[Dimensioned, Surfaced and Rough Clear (widths and lengths), 12 inches wide and over, add $1 ₱ M (on each corresponding grade) to the above list price of "Clear."]

TONGUED AND GROOVED—No. 1 T and G, 1x4, 12 feet and over, $32; No. 2 (refuse) do do do, $24; No. 1 T and G, 1x6, 12 ft and over, $30; No. 2 (refuse) do do do, $24; T and G, 1x6, 7 to 11 ft, $26; do do, under 7 ft, $23.

TONGUED, GROOVED AND BEADED—No. 1 T, G and Beaded, 1x4, 1¼x4 and 1¼x6, 12 ft and over, $32; No. 2 (refuse) do do do, $24; T, G and Beaded, 1x4, 1¼x4 and ¼x6, 7 to 11 ft, $27; do do, under 7 ft, $22.

ROUGH CLEAR—1x6 and under in width, and under 12 ft in length, $24.

[On a credit of 60 days, or a discount at the rate of 1 per cent per month for anticipated payments, and not less than 1 per cent per month added for extension of the same].

We quote cargo rates: Pine—Merchantable Rough, $15 ₱ M; Flooring, $24.20; Stepping, $37 ₱ M; Redwood—Merchantable Rough, $18; Surfaced, $32; Rough Clear, $32; Rustic, $33; Tongued and Grooved, $30; Tongued, Grooved and Beaded, $32.

Lumber at Retail.

Retail quotations for fir and spruce are as follows:

ROUGH MERCHANTABLE.—(Ordinary sizes) to 40 feet long, per M ft, $22.50; Rough Merchantable, 1x6, Fencing, $22.50; do do, 1x4, do, $23.50; do do, 1x3, do, $24.50; do do, 1x4, odd lengths, $22.50; do do, 1x6, do $21.60; do No. 2, all sizes, $18.50; do Selected, $26.50; do Clear, other than for T and G and Stepping, $31.

[Rough Clear for T and G and Stepping $1 ₱ M less than price of kind for which intended.]

Dressed T and G Flooring, 1x6, No. 1, vertical grain, ₱ M ft, $38.50; Dressed T and G Flooring, 1x6, No. 1, $33.50; do do do, No. 2, $28.50; Dressed T and G Flooring, 1x3, 1x4, 1¼x4 and over, No. 1, vertical grain, $40.50; do do do, No. 1, $35.50; do do do, No. 2, $29.50; Dressed Stepping, No. 1, vertical grain, $42.50; do do do, No. 1, $37.50; do do do, No. 2, $28.50.

SPRUCE—Rough Merchantable, ₱ M ft, $21.50; do Clear, $35; Clear Dressed (shelving), $40; Pickets (rough) board measure, $20.50; Furring, 1x2, per lineal ft, 1c; Laths, 1 and 1-¼inch, ₱ M, $3.60; 1½-inch, $4.

[N. B.—For all sizes over 14 inches, and lengths over 40 feet, extra rates].

Pine—Rough, $14.00: No. 2, $11.00; do do in lengths, $12.00; rough, 40 to 50 ft lengths, $15.00; do 50 to 60 ft, $16.00; T and G Flooring, 1x6, $25 00; do do 1¼x6, $27.00; do do 1x4, $27.00; do do No. 2, $20.00; Vertical Grain T and G Flooring, 1x6, $28.00; do do do 1¼x6, 1x4, $30.00; Stepping, $35.00; Furring, 1x2, per lineal ft, ¾c.

Redwood—Rough, $16 00; No. 2, $12.00; Surfaced, $30.00; do, 1x8, $28.00; do, 1x6, $23.00; T and G, 6 in. 12 ft and over, $28.00; do do, 7 to 11 ft, $25.00; do do, under 7 ft, $20.00; Rustic, $30.00; do No. 2, $25.00; T and G Beaded, 12 ft and over, $30.00; do do, 7 to 11 ft, $25.00; do do, under 7 ft, $20.00; Siding, ½ in, $22.50; Picket, fancy, $25.00; do, rough pointed, $16.00; do do, square, $14.00; Battens, 1x3 in, per lineal ft, ¾ c.; Shingles, $2.00; Laths, 1½, $3 25; do 1½, $3.75; Dunnage Boards, less 5 per cent, delivered, $16.00.

Nails.

We give the price list of the Pacific Iron and Nail Company.

FENCE AND BRAD.—10d to 60d, $2.90: 8d and 9d, $3.00 6d and 7d, $3.25 4d and 5d, $3.50; 3d, $4.25; 2d, $6.60

BARRELS.—2 inch, $6.75; ¾ inch, $5.75; 1 inch, $5.25; 1¼ inch, $4.50; 1½ inch, $4.25; 1¾ inch, $3.75; 1½ inch, $3.50.

LINING.—⅜ inch, $7.25; ¾ inch, $8.75.

TOBACCO.—10d, $3.25 8d, $3.60; 0d to 7d, $3.75.

CASING.—6d to 30d, $4.50.

SLATING.—6d, $3.75; 4d, $3.75; 3d, $4.50; 2d, $5.76.

FINISHING.—2d, 1 inch, $8.76; 3d, 1¼ inch, $6.76; 4d, 1½ to 1¾ inch, $4.50; 6d, 2 inch, $4.25; 8d, 2½ inch, $4.00; 10d, 1 inch and over, $3.76.

CASING AND BOX.—10d to 30d, $3.60; 8d, $3.75; 6d, $8.00; 4d, $4.25; 3d, $5.25.

FINE BLUED.—4d, $4.50; 3d, $5.75; 2d, $6.50

CUT SPIKES.—All sizes, $3.00

BOAT SPIKES.—All sizes, $3.60.

Each half keg 10 cents extra.

TERMS.—Note or acceptance at 60 days with current rate of Exchange on S. F., or a discount of 2 per cent for cash, if remitted within 10 days from date of delivery. All accounts when due subject to sight draft without notice.

An abatement of 10 cents per keg will be allowed upon orders of 200 kegs or over.

Building Material.

Lime, per barrel, $1.50@$1.60. Plaster, $2.76–3.00 Eastern Plaster, $3.00–3.25. Rosendale Cement, $2.26–2.75. Portland Cement, $3.50–3.75. Fire Brick, per 1,000, $40 @ $45, according to brand; hard, $9.00@$10,00; red, $8.00; soft, $7.00@7.60; face, $25.00.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JAÑRO C. HOAG—California.
J. J. BARTELL—Sacramento and San Joaquin Counties.
A. C. KNOX—San Louis Obispo and Santa Barbara Co's.
GEO. MCDOWELL—Santa Clara and Santa Cruz Co's.
G. W. INGALLS—Arizona.
M. S. PRIME—Alameda County.
MRS. OZIER—California.
W. H. H. HUSSEY—Contra Costa County.
F. W. SMITH, New Mexico.
W. B. TURNER, California.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if t is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY THE LABEL ON YOUR PAPER.

METALLURGICAL APPLIANCES.—We had a conversation this week with Dr. J. H. Rae, of Boston, a well-known inventor in metallurgical lines, who has come to this coast for the purpose of introducing some of his patents. We described, a few months since, the electric sodium amalgam manufactured by him. He is managing agent for the National Vacuum Dredge Co., for river, creek and beach mining. Dr. Rae is at present engaged principally with appliances for utilizing vapor fuel, and has at work in his office one of the vapor burners for stoves for domestic use. He has shown us the drawings of his smelting and roasting furnaces, in which the vapor fuel is used, this vapor being a highly heated product of crude oil and superheated steam. The method of utilization is quite simple and appears effective. We shall shortly give a more detailed description of this vapor fuel smelting and roasting plant. Dr. Rae is a pioneer in the matter of the application of electricity to the reduction of ores, and has patented a number of inventions. At his office, 240 Montgomery St., he has models and plans of a number of things of interest to the mining community.

THE MINING BUREAU.—The State Mining Bureau will hereafter be managed by a Board of Trustees, the State Mineralogist acting with their advice and co-operation. The law which makes this change was passed by the Legislature at its last session, as we mentioned at the time. The Governor last week appointed as Trustees the following gentlemen: George Hearst, Alvinza Hayward, J. Z. Davis, S. Heydenfeldt, Jr., and William Irelan, Jr. The State Mineralogist, Mr. Hanks, is at New Orleans, in charge of the California minerals. The Mining Bureau will be removed from its present quarters to the new Pioneer building on Fourth street, near Market, as soon as the building is completed, where it will have better facilities.

Dr. J. H. RAE & CO.,

240 Montgomery St., cor. Pine, San Francisco
7 Exchange Place, Boston, Mass.
MANAGING AGENTS.

VAPOR FUEL, for Furnaces, Smelting, Roasting and Domestic use.

NATIONAL VACUUM DREDGE CO., for River, Creek and Beach Mining.

ELECTRIC VOLTAIC AMALGAMATORS.

ELECTRIC SODIUM AMALGAM, being a storage of Electricity.

Electro Metallurgy a Specialty.

☞ Can be Consulted on Mines, Mills, Machinery, and the Application of Electricity to the Reduction of Ores.

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Smith's Patent Belt Fasteners.

Are positively unequaled for fastening **Leather, Rubber, or Cotton Belting.** THE ONLY FASTENER that will run under tighteners, on patent rolls in flour mills, and Electric Light machines **Easier to apply than Lacings and far more Economical.**

Patented Sept. 20, 1881; Aug. 15, 1882; June 16, 1884.

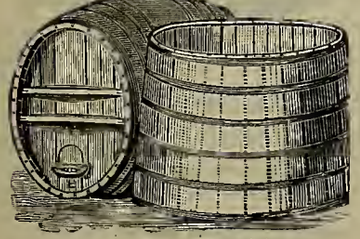
PRICE LIST.

No. 1—For large drive belts, per box of 100.....$2 00
No. 2—For Cotton drive belts, per box of 100..... 1 75
No. 3—For Rubber drive belts, per box of 100..... 1 50
No. 4—For single Leather belts, per box..... 1 25
Combination Punch with guides and nippers..... 1 25
Reamers for taking fasteners out..... 35

TRY THEM! They will save you loss of TIME, TEMPER and MONEY. Manufactured by

H. D. EDWARDS & CO.,
Nos. 16, 18 and 20 Woodward Ave., DETROIT, MICH.
Manufacturers of Oak Leather Belting. Agents for J. B. Hoyt & Co., N. Y. Belting and Packing Co., Eureka Fire Hose Co., Cotton Belting Mill Supplies. FOR SALE BY **Dunham, Carrigan & Co.**, San Francisco, Cal.

WATER TANKS! WINE TANKS!
CALIFORNIA WINE COOPERAGE CO.



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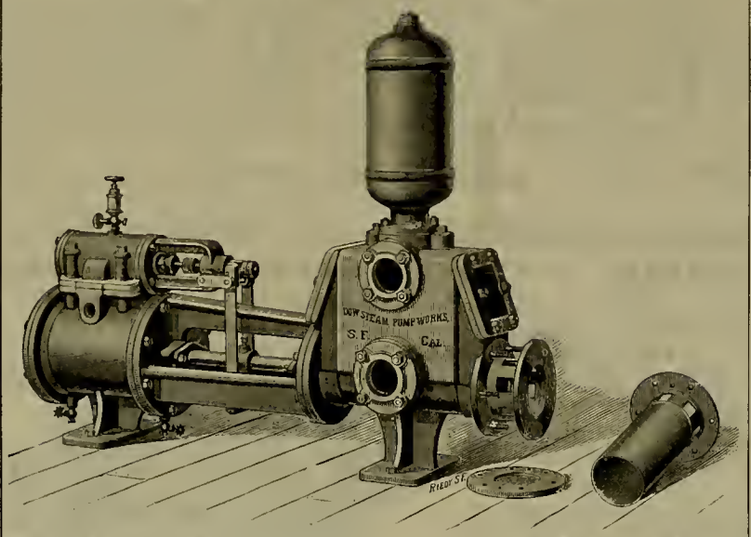
30 to 40 Spear St., - San Francisco
ALL KINDS OF CASKS, TANKS, Etc.
☞ SHIP, MINING, and WATER TANKS a Specialty. ☜

DOW STEAM PUMP WORKS,
San Francisco, Cal.



DOW'S IMPROVED STEAM PUMPS
And Pumping Machinery
FOR EVERY POSSIBLE DUTY.

COMPOUND PUMPING ENGINES,
Condensing and Non-Condensing,
.....FOR.....
Water-works,
Mining Purposes,
Irrigation, Etc.

WORKS: 114 and 116 BEALE STREET.

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PACIFIC ROLLING MILL CO.,
.....MANUFACTURERS OF.....
Cast Steel Castings and Steel Forgings
UP TO 20,000 LBS. WEIGHT.

True to pattern and superior in strength, toughness and durability to Cast or Wrought Iron in any position or for any service.

GEARINGS, SHOES, DIES, CAMS, TAPPETS, PISTON-HEADS, RAILROAD and MACHINERY CASTINGS of Every Description.

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HOMOGENEOUS STEEL, SOFT and DUCTILE,
SUPERIOR TO IRON FOR
LOCOMOTIVE AND MARINE FORGINGS.

ALSO Rods, from ¼ to 3 inch diameter and Flats from 1 to 8 inch. Angles, Tees, Channels and other shapes, Steel Wagon, Buggy, and Truck Tires, Plow Steel; also Machinery and Special Shape Steel to size and lengths. ALSO, **STEEL RAILS** from 12 to 45 pounds per yard. ALSO, **Railroad and Merchant Iron**, Rolled Beams, Angle, Channel, and T iron, Bridge and Machine Bolts, Lag Screws, Nuts, Washers, Ship and Boat Spikes; also, Steamboat Shafts, Cranks, Pistons, Connecting Rods, etc. Car and Locomotive Axles and Frames.

HIGHEST PRICE PAID FOR SCRAP IRON AND STEEL.

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STEAM ENGINES & BOILERS.
Carry Engines and Boilers in Stock for Immediate delivery.

H. P. GREGORY & CO, Sole Agents, 2 and 4 California St., S. F., Cal.

DIVIDEND NOTICE.

Plymouth Consolidated Gold Mining Co.—

23 Nassau Street, New York, March 26, 1885.

DIVIDEND NO. 23.—The twenty-third consecutive monthly dividend of Fifty Thousand Dollars, being One per cent on the capital stock, or Fifty Cents per share, will be paid on the sixth day of April, at the Company's offices in New York and San Francisco. Books close on the 4th.

W. VAN NORDEN,
President.

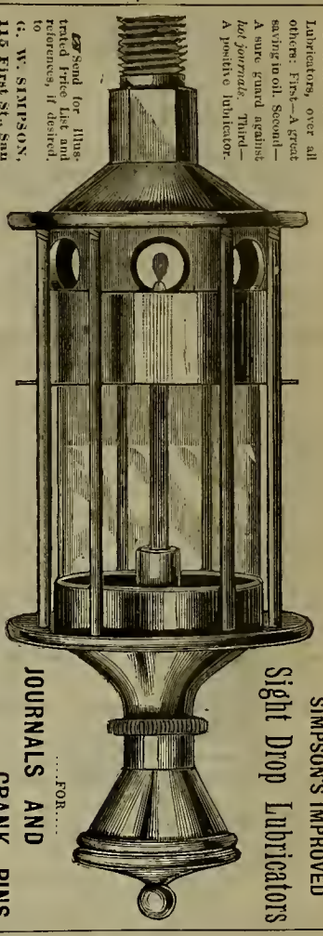
The California Perforating Screen Co.
Al kinds of Quartz Screens, slot or round holes; zinc, copper and brass for flour and other mills. 214 CALIFORNIA ST., SAN FRANCISCO.

HEALD'S BUSINESS COLLEGE, 24 Post St, S. F. Send for Circular.

Engraving. Superior Wood and Metal Engraving, Electrotyping and Stereotyping done at the office of the MINING AND SCIENTIFIC PRESS, San Francisco, at favorable rates.

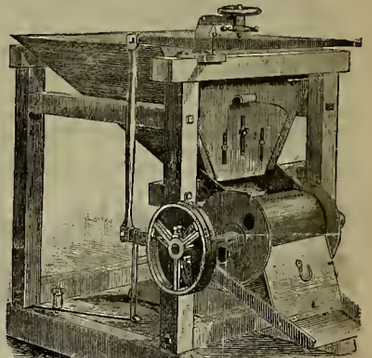
I claim for these Lubricators, over all others: First—A great saving in oil. Second—A sure guard against *hot journals*. Third—A positive lubricator.

☞ Send for Illustrated Price List and References, if desired.
G. W. SIMPSON,
115 First St., San Francisco, Cal.



SIMPSON'S IMPROVED
Sight Drop Lubricators
.....FOR.....
JOURNALS AND CRANK PINS.

THE ORIGINAL
Roller Ore Feeder.
(PATENTED JUNE 24, 1873.)

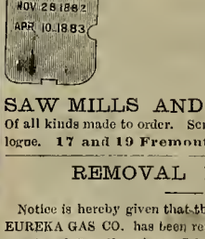


This form of Ore Feeder is well adapted for its peculiar work.

Manufacturers of the Celebrated "Challenge" Ore Feeders for wet and sticky ores; also "Stanford Improved" Ore Feeders and Tullock's Ore Feeders for dry ores.

☞ Prices furnished upon application to
JOSHUA HENDY MACHINE WORKS,
39 to 51 Fremont St., San Francisco.

N. W. SPAULDING
SAW COMPANY



Manufacturers of
SPAULDING'S
Inserted Tooth
AND
CHISEL BIT
CIRCULAR
Saws.

SAW MILLS AND MACHINERY
Of all kinds made to order. Send for Descriptive Catalogue. 17 and 19 Fremont St., San Francisco.

REMOVAL NOTICE.

Notice is hereby given that the principal office of the EUREKA GAS CO. has been removed from the city and county of San Francisco, Cal., to the city of Eureka, Humboldt Co., Cal.

C. S. BACHELDER, Secretary.

San Francisco, March 27, 1885.

Iron and Machine Works.

Golden State & Miners Iron Works.

Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.

STEVENSON'S PATENT

Mold-Board AMALGAMATORS,

Golden State Pressure Blowers.

First St., between Howard & Folsom, S. F

California Brass Foundry,

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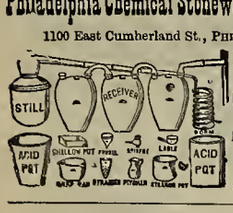

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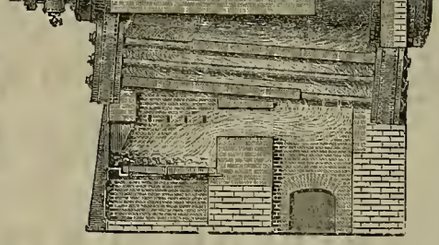

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Risdon Iron and Locomotive Works—Gentlemen: We have had one of your Heine Patent Safety Boilers in use for four months at our Borax Works, in Alameda. It does good work and gives perfect satisfaction. Yours truly,
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(Signed) W. S. TOWNSEND.

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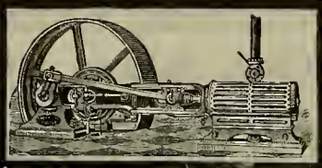

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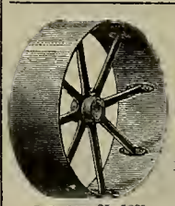

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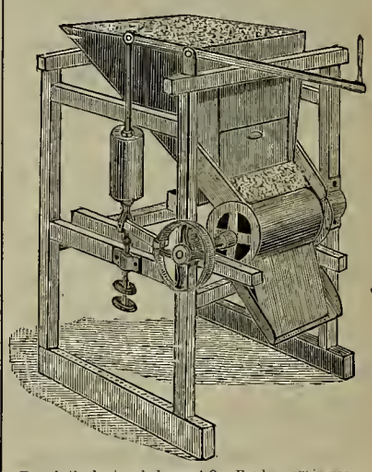
[Patented May 28, 1882.]



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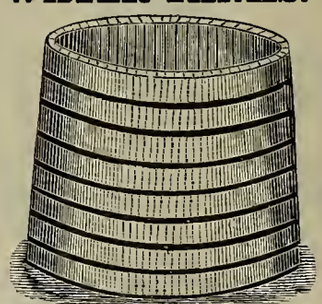

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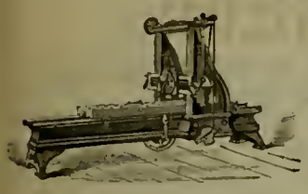

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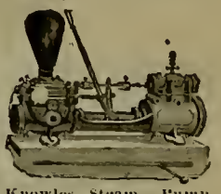

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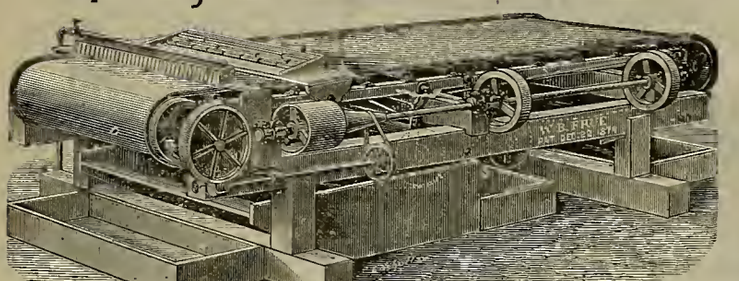

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The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement on pateuts owned by them.

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N. B.—We are and have been ready at any time to make a competitive trial against the Triumph, or any other Concentrator for stakes of $1,000.

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In a competitive trial recently had between two of the **"Triumph" Ore Concentrators** and the same number of **"Frue" Vanning Machines**, at the mill of the celebrated gold producing Original Empire Mill and Mining Company, in Grass Valley, Nevada County, Cal., the "Triumphs" produced thirteen and fifteen one-hundredths (13.15) per cent more concentrations than did the "Frue" Vanners, during a run of twenty-four consecutive days, or a net gold coin result of $199.15, or $8.30 per day, in favor of the two "Triumph" Concentrators.

These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarly saved, which is lost on the "Frue" Vanners.

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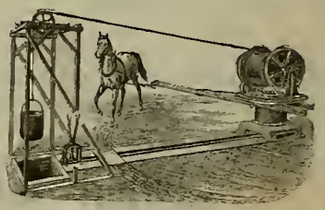

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B. N. VAN BRUNT, Secretary.

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MINING AND SCIENTIFIC PRESS.

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BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, APRIL 18, 1885.

VOLUME XLXX Number 16.

The Hesse Water Meter.

It is claimed that nearly one-half of the water consumed in our cities is uselessly wasted. It is douhtful if this lavish consumption is on the whole a sanitary benefit, the waste being in large part the result either of leakage or of willful negligence, and not of a character to effect any proper flushing of closets and sewers. By placing meters near the point where the sewer pipes enter the premises, and thus making consumers responsible for such negligence and for defective plumbing, a wiser use of water is effected. In order to prevent the penurious consumer from pursuing an economy so stringent as to result in certain sanitary evils, it is recommended that a minimum quantity of say 10 or 20 gallons per capita per diem he established, and the consumer charged for this whether he uses it or not. The water department of Providence, R. I., makes a minimum charge of $10 per year (equivalent to ahout 100 gallons per diem) for each meter service. Metera were provided in Providence for ahout one-half the total number of services, and a decided economy effected. The daily consumption at present is ahout 350 gallons per service, or 25 to 30 per capita—less than one-half the average in American cities.

When the water supply of a city employing

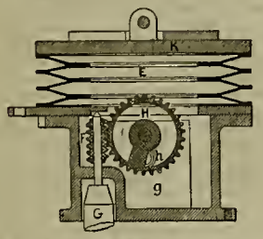

Fig. 3.—Vertical System of Diaphragm.

few meters hecomes inadequato to meet the demands of the consumers, two propositions may he entertained: the increasing of the capacity of its water works, and the introduction of meters. It is maintained that in most cases the latter proposition is by far the most economical.

It seems inevitahle that the meter system should rapidly grow in favor with improvement of the present forms of meter. In a few cities their use is already extensive. In London nearly 40 per cent. of the houses supplied hy the various water companies are now provided with meters. In New York and Boston meters have heen introduced into from 5 to 10 per cent of the services. In Providence, R. I., 50 per cent. In San Francisco, 20 per cent. In Oakland, 3 or 4 per cent.

At a recent meeting of the Technical Society of the Pacific Coast Mr. Ross E. Browne, of the University of California, read a paper on "Water Meters," in which were given comparative tests of accuracy, delivery, etc., and the distinctive features of typical metera, such as the Worthington, Kennedy, Siemens and Hesse. The latter is a meter devised hy Prof. F. G. Hesse, of the University of California, and is of the class known as velocity or inferential meters. We give engravings of the new meter on this page. The operations of this meter as described hy Mr. Browne, are as follows:

The water from the inlet pipe enters channel *A* (fig. 1), passes through openings *a a* (figs. 1 and 2), and striking the huckets *b b*, imparts motion to the measuring wheel—a pressure wheel similar in character to that of the "German" Siemens. The water passes then from the wheel chamber *B* into chamher *C*, mainly through valve opening *d* (fig. 1), and in that portion of the water which passes through chamber *g*. In the position of the worm wheel shown in fig. 3, the solid arm of the wheel (the cause of this interruption) is just passing the openings *f* and *h*, hence direct flow through

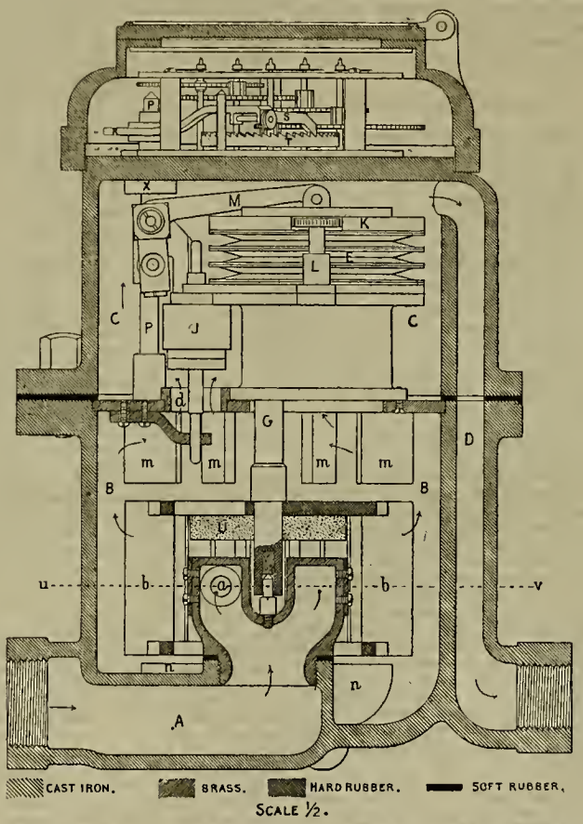

FIG. 1.—VERTICAL SECTION OF HESSE WATER METER.

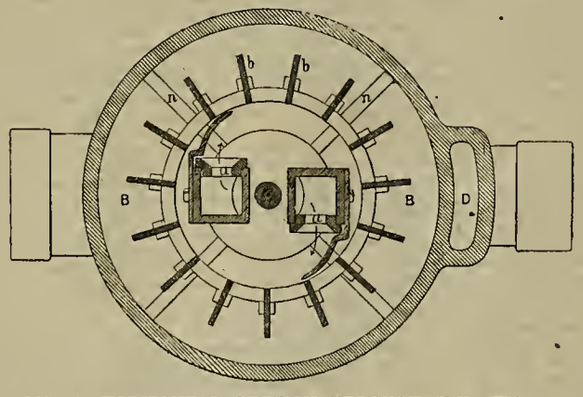

FIG. 2.—HORIZONTAL SECTION THROUGH U-V. (FIG. 1.)

part through chamher *e*, opening *f*, chamher *g*, and conical tuhe *h* (figs. 3 and 4), and is finally discharged through chamher *D* into the outlet pipe.

The motion of the measuring wheel is transmitted to the worm wheel *H* (figs. 3 and 4), hy means of the endless screw *F* (fig. 3) which is attached to the upper end of the wheel spindle *G* (figs. 1 and 3). This worm wheel, in revolving, interrupts intermittently the direct flow of these openings is just heginning. During the interval of direct flow the action is comparahle to that of the jet pump, causing the pressure in chamher *g* to fall helow that in chamher *C*. The interruption of the direct flow causes the pressure to rise ahove that in chamher *C*.

The alternating high and low pressures in chamher *g*, thus induced hy the slow rotation of the worm wheel, cause the cap *K* of the helows-like ruhher diaphragm *E* (figs. 1, 3 and 4) to rise and fall accordingly. Tho number of such pulsations or atrokes is directly proportional to the number of rotations of the measuring wheel. The length of the stroke is limited hy the heads of set screws *L L*.

This reciprocating motion of the cap *K* is transmitted and converted into the circular motion of the gear wheels of the index, through a lever, rock-shaft, shaft, lever, pawl and ratchet wheel *T*.

The dial hands are thus made to register a quantity which is directly proportional to the number of revolutions of the measuring wheel. The measuring wheel is made of hard ruhher of specific gravity 1.2, aud with the cork attachment (*U*) has the same weight as an equal volume of water. [The cork attachment is really unnecessary as the weight of the wheel or water is sufficiently small without it.] There is then so little pressure upon the journals of the spindle *G*, that the frictional resistance offered is exceedingly small. The worm wheel *H* resta loosely in its hearings, offering hut little resistance to rotation. Since in 38 revolutions of the measuring wheel hut one revolution is given to the worm wheel, the work and hence the effective resistance is minute. The frictional resistance due to the periodic pressure upon the journals of the worm wheel, as

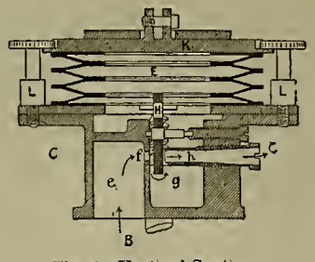

Fig. 4.—Vertical Section.

the arm passing openiug *f*, was found hy experiment to he very small.

When the meter is delivering water at ratea ahove three or four gallons per minute, the valve *J* ia lifted, hut the difference of pressures in chamhers *B* and *C* is far greater than that needed to operate the hellows. When the rate of delivery is small, the valve is seated, and the entire quantity is forced through chamher *g*, insuring the action of the hellows.

The alternate rise and fall of pressure in chamber *q* furnish an ahundant surplus of power to provide against undue resistance in the stuffing box X (Fig. 1), and all differences due to the character of the workmanship, and to wear or corrosion of the parts of the registering apparatus.

The measuring wheel does not supply the power expended in moving the registering apparatus, hence the unavoidahle changes in the latter do not affect the accuracy of the meter. This points to the distinctive feature of the Hesse meter.

m m and *n n* (Figs. 1 and 2) are stationary ribs provided for the purpose of checking in part the rotation of the water iu chamher B, and offering additional resistance to the motion of the wheel. Such resistance diminishes the detrimental influence of the solid friction and causes almost immediate stoppage of the wheel in case the water is suddenly shut off. Entire weight of meter is 21.4 pounds.

The material used in constructing the meter is shown hy the manner of shading the sections.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Forest City Gold Mines.

EDITORS PRESS.—Since the disastrous and sweeping fire of a little over two years ago, that destroyed all the business houses and many private dwellings of Forest City, another town of far more beautiful and commodious structures has been, as if by magic, rebuilt on the site of the old, and the sunshine of prosperity has continually brightened the streets of this noted pioneer mining camp. The population is large, and the people are generally prosperous. How could this be otherwise, encircled as they are with these lofty, snow-clad mountains, inlaid with gold? Wishing to visit these Aladdin caves of subterranean wealth, your correspondent gladly accepted an invitation courteously extended to him to take a trip through the Bald Mountain drift mine with the acting superintendent, Wm. Meikle (State Senator Wallis has returned from Sacramento since, and assumed his position as superintendent of the Bald Mountain). I seated myself in an empty car, and soon the mouse-shaped locomotive whistle shrieked *adios*, and our train, filled with miners and their tin pails, and heavy timbers and other material needed underground, was rolling over the steel rails at a fearful speed through the crooked tunnel for upward of a mile or more to the lava flow, under which is now being found cemented, black-colored gravel that averages at least $10 per carload. The tunnel formerly extended 3,200 feet further ahead up to the Ruby line, but has been closed. While coming back with the pillars, all that remained unworked of the rich gravel lead has, within the past few years, aggregated a gross yield of over $4,000,000, fully half of which has been divided by the lucky stockholders. At one period more than two hundred men were constantly employed. There are now but forty names on the pay roll. Length of incline, 146 feet—44 feet perpendicular. Six men work the windlass, 22 drift, 2 run the cars and the rest are busy on repairs. The air is so light that no powder is used. Five hundred carloads of pay gravel are rolled out each week. At some very remote period in the past a wide, auriferous river flowed down through the upper country. The bed of this stream was evidently cut later by a deep channel, afterwards filled with lava. The gold found here is exactly similar in color and form to that of the Bald Mountain Extension lead over a mile northeast further up the ridge, the difference in value being but 23 cents an ounce. The width of this gold channel probably is not more than that which was swept away, unless the deepest, ancient river gravel also is rich with gold; and, if so, it must be of a different character than what is now found. In such event the future of the Bald Mountain may be as brilliant and prosperous as has been its past history. The sale of bullion from this mine from January 1st to December 31, 1884, was $111,216.37; and from January 1st to March 22, 1885, $32,068.29, a total of $143,284.66. Cost of labor from January 1st to December 31, 1884, $52,084.05; from January 1st to March 22, 1885, $11,169.75, total $63,253.80.

March 18th a dividend of $18,000 was declared, $900 to the interest. In places the gravel is found on benches below the lava. Thus far but little water has been tapped, thus rendering practicable the present mode of working. Returning to daylight, your correspondent was rolled out in an empty car by one of the miners, the time being seldom beaten by the usual speed of the railroads. The next day I was kindly invited by Supt. W. Lawry, of the Bald Mountain Extension, to visit that mine, and, at an early hour in the morning, with the day shift, we were drawn in cars through the main tunnel by mules to the foot of the incline at the eastern side of the lava flow. The main tunnel is an air-line for 2,350 feet with a grade of ½ inch to 12 feet. Nine hundred feet of this was blasted through lava. The entire length of main tunnel is 6,285 feet, the face of which is fully 500 ft. under the surface of the mountain; width of second lava flow, 1,300 feet; steel rail is laid for 2,700 feet. The main tunnel is in first-class order. Average number of carloads of gravel taken out daily, 200—26 trains of eight cars come out each 24 hours. A horse-shoe is suspended over the entrance to the main tunnel for "good luck." At the incline the loaded cars coming down pull up the empty ones by means of a wire cable three-fourths of an inch in diameter, unrolled from a drum at the top. There is a self-acting switch in the center of the incline, the widest part, where the cars pass each other, the balance of the way there being but a single track. The gold lead is now being followed north, and nuggets weighing from a half-ounce to 1½ ounces are frequently picked up by the miners in the breasts. The pay gravel extends only one or two feet above the bedrock. The gravel is of a whitish color, making it very difficult for an amateur to see the gold. The face of the main tunnel is now partly in gravel. Length of the incline is 260 feet. There are 54 names on the pay-roll. In time the probabilities are that as the ground is more thoroughly opened this number will be largely increased—perhaps to 200, as was the case with the Bald Mountain in its brightest days. The gold assays from 941 to 9,515, and is sold to Chas. Heintzen at Forest City, at $18.60 per ounce. There is but little water in the breasts of the north. Between the two lava flows the main tunnel passes through a dike 45 feet wide, and the rest of the distance is bedrock, but little of which is hard. During March, 1885, there were 18 pounds of gold, lacking one pennyweight, taken out of the mine. The clean-up, April 5th, for the previous six days' work, was 130 ounces. The gross gold receipts for 1884 are $69,125.54; paid for labor, $41,061.86; gold dust sold from Jan. 1st to Feb. 28, 1885, $8,372,72; paid for labor in that time, $6,321.75. Total value of bullion produced by the Bald Mountain and Bald Mountain Extension for 1884, $180,341.91, of which sum $93,145.91 has been paid to the miners, besides the settlement of timber and other supply bills. With such a princely revenue is it strange that Forest City is one of the most prosperous mining camps in the Sierra Nevada? And, better still, the prospect is deemed to be certain that this income is but a trifle compared with what will be yielded by these mines in the near future. The Bald Mountain Extension lead extends for miles up the ridge and beyond through the Arizona, Wallis Consolidated and Savage locations, all of which will eventually be developed into good-paying properties, lucrative investments for their owners, pouring forth a constant tribute to the treasury of the world. The Ruby drift mine clean-up, Sunday, April 5th, for the past week's sluicing, was 107 ounces, a large increase on previous returns that will be cheering news to its energetic and persevering owners, most of whom are residents of your city. Let the good work continue. It makes none the *poorer*, and many *do* enrich themselves and their friends in the development of our seemingly limitless treasure fields. PROSPECTOR.

Forest City, Sierra Co., Cal., April 5, 1885.

California Chrome Ores.

The State mineralogist is satisfied that the chrome ores of California are being sold too cheap. Of course, it is the policy of those who require these valuable ores to buy them at the lowest possible price, but it is not to the advantage of the State to deplete all the mines, and ship away the ores which should be saved for that time, not very far distant, when California will be a great manufacturing State. At the present ruinous prices, European consumers can afford to buy and store the ores, which the Californians are willing to dispose of at a trifle above cost of mining. The bane of the California miner and prospector is the desire to quickly realize on what he may discover. The rights of future generations, the requirements of manufactories yet to be established in the State, and the best interests of the State, are wholly ignored, in the selfish desire to get something for nothing, or to become rich without economy and labor. The same policy has caused enormous waste in the working of the rich ores of other metals in the State. The fact that half the mineral went to waste was no consideration, as long as the other half was immediately available. There being little or no competition, those having ores to sell must take what is offered or allow them to remain in the mines, which, by far the best policy, does not meet the views of our miners. According to the recent report of Dr. James Hector, of the Geological Survey of New Zealand, chromic iron containing fifty per cent of chromic oxide is worth from eleven to twenty pounds sterling per ton ($52 to $97.) This is from seven to twelve times the prices at which California chrome ores have been sold. Chrome iron imparts a green color to minerals and rocks with which it is associated. There is a variety of serpentine highly prized as an ornamental stone, known as "verd antique" (*vert antixqe*), oppiolite (*verde antico*) of the Italians and ancient Romans, which is a green serpentine, sometimes brecciated with strings of white steatite or noble serpentine veining it beautifully. It receives a high polish, but will not withstand the action of time. "*Verde di Prato*" is found in the Apennines, a few miles from Florence. It was largely used in the interior decoration of the Cathedral of Florence. "*Verde de Genova*" is found, as the name indicates, near Genoa. It contains veins of white and light green calc spar in green serpentine. These ornamental stones are again mentioned here in the hope that some prospector may search for and haply find a deposit of verd antique among the numerous localities of serpentine and chrome iron in California. The most of the chromic iron that has heretofore left the country has been sent, in the first instance, to San Francisco, and thence shipped around Cape Horn. More recently consignments are being made via the Isthmus, or overland by rail, small lots from the Placer county mines having gone forward during the past year by both of these routes.

THERE is a vast difference between prospectors. Among our acquaintances is an old time prospector who has made a dozen rich strikes and is the discoverer of several of our most productive mines, who to-day has not a dollar and walks the streets almost in rags. Then there is another 49er who never, to our knowledge, made an important discovery, and yet has accumulated a competence from little strikes and fortunate sales.—*Arizona Miner.*

Labor and Emigration.

One of the most notable economic problems of the day, and one in which both Europe and the United States are deeply interested, is the immense stream of emigration, which for many years has been setting westward across the Atlantic with increasing, rather than abating volume. When this movement first commenced it was made up chiefly of the peasantry and agricultural laborers of Europe. It is only within a few years past that skilled mechanics formed any considerable portion of that emigration. The receptivity of this country for the former class has been very great and is still comparatively so. Our vast regions of unoccupied lands presented a most tempting invitation to the poor, landless and crowded populations of Europe to come and take up land at a mere nominal or no cost whatever, and build up for themselves and children comfortable homes, with wide expanse of woodland, meadow and field.

It is thus that much of the very best bone and sinew of Europe has been transplanted to America. European countries at first regarded this exodus with much favor, especially as it relieved their overburdened centers of population of much undesirable presence, and to some extent of that of a decidedly dangerous character. Hordes of paupers, unthrifty and unclean—people of no good to themselves and of no benefit to the community which they left or to which they came, crowded themselves among the generally honest and desirable class of emigrants. As these latter began to come prominently to the front, our authorities enacted discriminating laws in regard to the character of the emigration which could be set down upon our shores, the effect of which was to greatly improve its character; and it soon began to number many business people and those of means as well. Next we find that the exodus included quite a large volume of skilled laborers, mechanics, artisans, etc. These we gladly received; but their departure began to cause friction at home. It was too desirable an element to part with. But its stoppage was not a thing to be readily accomplished.

And now, within a few of the later years this exodus has assumed a still more formidable aspect. During that time capital also began to move in this direction. Entire manufacturing establishments, whole plants, owners, men and machinery—all except the buildings themselves have taken up the line of march and have been settling down here and there in the United States, until now all the way from New England to Georgia may be seen at intervals flourishing establishments thus transplanted, and representing almost every branch of manufacturing industry in wool, cotton, silk and iron. The money value of this movement has already reached many millions of dollars, and is producing unmistakable friction—friction at both ends of the line. It is death to the old country; it is disturbance in the new. The reasons are obvious—too obvious at the European end to need remark.

In regard to this end of the column, the dominant policy here has been one of more or less protection to our industries. This policy has worked to the disadvantage of the European manufacturer. By reason of our tariff laws he cannot sell his home manufactured goods here, so he pulls up stakes and comes here to manufacture his goods on American soil. This looked all right at the start. Even now but few see any evil to flow from the movement. The argument is, that it is not in accordance with our policy or with the laws of reciprocity and humanity to restrict the movements of people from one country to another, when they are unobjectionable in character and go or come for worthy motives. But still the outcome of the movement works much hardship on this side of the Atlantic by reason of the larger influx of producers over consumers, by which we are getting into our communities an excess of skilled labor. The troubles growing out of this reach far out into the future. Labor, in its efforts to protect itself and keep down the growing surplus, is holding up its hands against the introduction of its own offspring into the shop. The number of apprentices which, under the rules of labor unions, may be employed in any shop is so small that an opportunity is presented for only a very small portion of the boys in our community to learn profitable trades, whereby they, in turn, may be able to gain support for themselves and future families. All this is being done too, while the doors are kept wide open for foreign skilled labor to come and go at its pleasure. In other words our laborers are being born, brought up through their days of consumption and non-production, in a foreign country and finally set down here, full-fledged, to enter our shops and take the place which by nature and right belongs to the boys, born and brought up here. We ought, above all things, to be able to produce our own skilled labor; and our public policy should be shaped to give us at least a reasonable advantage in that direction. The policy now in vogue, however, is in accordance with the principles of our Government and with our severed declaration of rights; but what of the outcome? Is there not danger of friction—friction which in the near future may produce sparks, that may lead to disastrous consequences.

There are thoughtful and observing men among us who see and fully appreciate the difficulties and danger of the situation—men who feel that something must be done, and that at once, to avert the threatened danger. There are only two ways out of the dilemma—we must either check the influx of foreign skilled labor, and the consequent reduction of the condition of the American laborer to that of the pauper labor of Europe, or provide a larger market for the products of the excess of that class of labor. The former is so averse to our settled convictions and organic principles that nothing but the actual presence of disaster could induce our people to accept it. The latter is open to no objection whatever, and, fortunately, is within our immediate reach. To some extent our national policy of protection, if carried a little further, may aid in the matter. A further aid may be found in educating our manufacturers and merchants more fully in the intricacies of foreign trade. This is now being done through the publication of our consular reports, and might be still further supplemented by the establishment of Commissions similar to the one at present in South America, if Congress only had the discretion and wisdom to make proper appointments, and thus render such Commissions purely business enterprises instead of junketing excursions. A further, and the one which we consider the most important of all, is the organization of

Proper Immigration Bureaus,

Especially throughout our Mississippi and farther western States. A few States have already entered earnestly upon this work, among which we may especially note California and Kansas. The object of these associations would be to encourage, by the dissemination of proper knowledge, the most desirable class of immigration, which as a general thing would be consumers instead of producers—that class of immigrants which will take up our public lands in small homesteads, or buy such as are improved, and build up thereon permanent homes. All such, naturally become consumers of the products of skilled labor, of which kind alone, we have a surplus. Such a class of immigration builds up the wealth and adds to the prosperity of a people far more rapidly than does the influx of skilled labor, so long as we are already fully supplied with that really needful element. That is the class of immigration that leads to the real advancement of the value of land legitimately produced by settlement and cultivation. There is nothing artificial in such values. They are legitimate and permanent, and that is the kind of value and the kind of population which makes a country great and powerful, and self-sustaining.

No Large Land-holdings Wanted.

There is another source of danger which this class of immigrants will tend to remove. It will lead to the eventual breaking up of the large land-holdings, which are always a drawback on any community. And this leads us to speak of a newly developed element of disturbance in this direction, which should be stamped out once in favor of the desirable class of immigration to which we are alluding—that is, the enormous movement of foreign capital for investment in the uncultivated lands of the great central portions of the country, mostly in the interest of cattle raising on an immense scale to the detriment of small cattle owners, and without any reasonable probability of leading to a reduction in the price of meat for the benefit of the consumer. The profits of such enterprises will inure solely to the benefit of foreign capitalists. The amount of money recently invested in that direction has been estimated at the enormous sum of $100,000,000, and is probably much more and constantly increasing. The amount involved, however, is immaterial in this connection. It is the principle which we most consider in the matter, and the effect which the policy will have upon the industries of the country. If this movement is allowed to go on unchecked and gather force and power, it will soon form a large factor in leading the country to a crisis of most tremendous import. But the space allowed to this article has already been exceeded, and we here close by simply referring to the self-evident fact that we need those lands and *must have them* to make homes for the millions of the earth cultivators which we now need to consume our leading cereal products and the diverse products of our skilled labor. By encouraging this important immigration movement we shall be able to avert the impending crisis for a time, at least until our people can recover themselves from the anomalous condition into which the great multiplication of modern machinery and the devious and questionable ways of modern capital seem to have most unexpectedly plunged them, and gain time to look around and properly adjust our national policy to the anomalous condition of things with which we are now so suddenly confronted.

THE Plymouth Consolidated Gold Mining Company of Amador, California, has declared its twenty-third consecutive dividend of 50 cents per share, payable in New York and San Francisco. This mine is making a splendid record and is doing much to call general attention to the fact that California gold mines, properly managed, can be made very profitable.

ROYALTY.—The Sutro Tunnel Company's receipts from royalty during the past year have amounted to $125,617.81, being an increase of $54,102.16 over the receipts of the previous year from that source.

MECHANICAL PROGRESS.

Something New in Steel.

Many of the changes wrought in iron and steel in the various processes of manufacture and use are almost magical in character. The subjoined, from the New York *Sun* records one of the latest of these changes.

Following the recent developments in the use of dynamite shells in common field cannons charged with powder is a new departure in the manufacture of cannon. It comes from the apparently endless variety of uses made of mild, or Bessemer process, steel, and is probably the most astonishing application yet made of that metal.

In 1880, about the time mild steel came largely into the market, the president of a company manufacturing seamless brass and copper pipe, concluded to try mild steel as a substitute in certain directions for the more expensive brass, copper and other metals used in his establishment. The process of manufacture was simple. A plate of metal was placed over a die and a mandrel forced the plate into it just as a lady might place a piece of tissue paper over her thimble and then force it in with her finger. The mandrel would force the metal into a shape like a deep bowl, with sides of uniform thickness. By repeating this process with other dies and mandrels, hydraulic presses being used to shove the mandrel through the die, the plate of steel eventually became a steel tube of uniform thickness and perfect bore and circumference. The steel was found to work as easily as the brass or copper, and no change of tools was necessary.

As steel was cheaper than copper, the advantage of substituting drawn steel seamless tubes for brass or copper ones was manifest. But the saving in price was altogether the smallest gain. To the astonishment of those engaged in the experiment, the steel was found to have radically changed its character in the process. It went into the machine soft and pliable. It came out, although drawn cold, a beautifully tempered spring. If a tube was compressed, it would instantly resume its shape when the pressure was removed. If struck with a hammer it rang like a bell, while tests of the increased strength of the metal showed a change that was wonderful. To fully test its strength a boiler of the size and style used beside every range in New York flats was made from the steel by this process. The metal of the boiler was drawn out to the thickness of about one-thirtieth of an inch, and then it stood a pressure of 600 pounds to the square inch, giving way when that limit was passed.

After this and other tests the experimenters began to wonder why a gun barrel could not be made of steel by this process that would be superior to any other. They first made a tube of six inches bore and half an inch thickness of metal. This was drawn cold. Then another was made of the same thickness of metal, and of a bore that would permit it to be shoved over the first one by the hydraulic press when it was warmed, the first remaining cold. A third was then drawn over the two, and thus was completed a cannon. It was found that it would stand a water pressure of 75,000 pounds to the square inch. This cannon has been sent to Sandy Hook, and the officers of the artillery corps will try to burst it by the usual tests applied to new cannon. They have before them the astonishing spectacle of a gun that will throw a solid shot weighing 100 pounds, although the metal is only one inch and a half thick around the powder. To people accustomed to seeing the common cannon, enormously thick at the breach, it will seem incredible that an inch and a half of this metal will serve the purpose better.

It is well-known that one cause of the high price of illuminating gas to the consumer is the great quantity lost by leakage through the cast-iron pipes used. In Pittsburg it was found that this leakage of the natural gas was so great that serious and fatal explosions occurred. Every foot of the cast-iron mains there has in consequence been ordered out. The great size of the bore needed prevented the use of lap-welded wrought-iron pipe, and the seamless pipe of paper thickness will be used, its great density being proof against any leakage of gas or liquid under any pressure. The tendency to corrode even under ground is very small, but this objection to steel will be wholly obviated by coatings either of tin or aluminium bronze within and without. The steel pipe is not only better, but cheaper.

Milk cans are being made of the new steel tubing. The bottom is an eighth of an inch thick, and the sides about one-fourth of an inch. The banging of the most vigorous Yankee cheese-maker or of the most reckless brakeman on a milk train cannot dent them or seriously injure them.

The experimenters have also turned their attention to clock springs, and they have found that the new process not only makes a cheaper, but a superior quality of spring. Just what change the metal undergoes in this process of drawing has not been determined. That it becomes fibrous is plain. Iron drawn out into wire becomes fibrous also, but it does not become a tempered spring.

CAST-IRON COLUMNS AS MAIN SUPPORTS.—The employment of cast iron columns as main supports has been greatly restricted at Berlin by a regulation issued from the architects' department of the police authorities of that city. The order has been issued in consequence of a discovery made last winter at a fire, when it was found that the cast-iron columns had been cracked by the effect of the cold water playing on them while hot. The authorities now insist that where partition walls rest upon cast-iron columns the latter are to be covered with plaster or bricked in, with an air space between the bricks and the column.

Fiber in Nails.

Unless cut nails are made from better material than is used generally now, their place in the market will be usurped by nails made from fibrous material. Wire nails are very favorably regarded, and are used in preference to cut nails on account of their superior tenacity, notwithstanding superior cost. The iron for cut nails, after being rolled, is slitted or cut lengthwise to a width adapted to the length of the nail to be cut. The length of the nails so cut is directly across the fiber which the iron has acquired by rolling, and, of course, shows its weakest where it should be the strongest. The ordinary cut nails will not drive into seasoned hard wood without "crippling," even under direct blows, and when the blow of the hammer is slightly on one side, they snap like clay pipe stems—they have no tenacity. The weakness of these nails is shown by the fact that it is almost impossible to straighten one that has been drawn from the wood, and then drive it again; in many or most instances, the nail will break in drawing.

On the contrary, the wire nails may be crooked into corkscrews, and then be straightened and be re-driven. They are not only tough, but they are stiff, and will penetrate hard wood where the cut nail would break sharply off or hopelessly crook beyond restraightening. In every respect the fibrous nail is better than the crosscut nail. If it could be afforded at the same or approximate price, it would take the place of the ordinary cut nail.—*Manufacturer and Builder.*

BESSEMER STEEL FOR ENGINEERS' TOOLS.—How nearly Bessemer steel can be brought to crucible in its usefulness for tools is a matter than which there are few more important to the machinery engineer. The advance of the Bessemer metal in this respect means to him a considerable saving of money. It may not, perhaps, be generally known that Bessemer steel is now used for a very great variety of purposes, for which, until recently, crucible steel was thought to be a necessity. Bessemer steel, besides its use for heavy work, is now wrought into roll-turning and lathe-turning tools, chisels, files, shear blades, rail drills, rail punches, shear steel for welding to iron, miners' drills and tools, picks, shovels, hand hammers, roller bar and cotton spindles, locomotive engine, wagon, carriage, coach and furniture springs, bolts, nuts, rivets, pit ropes, telegraph, crinoline and corset wire, umbrella frames, wire for musical instruments, and the like. Nor has cutlery itself been found too hard a test; for this special steel has been made even into razors with decidedly good results.

A MISTAKE WHICH IS FREQUENTLY MADE IN SETTING BOILERS.—A mistake which is frequently made in setting boilers, says the *Locomotive*, consists in loading them down on top with a great mass of brick-work, which often does more harm than good. Of course some good non conducting covering is necessary if we wish to attain a high degree of economy, but for boilers some of the lighter coverings are much to be preferred to brick. This is especially true in the case of long cylinder boilers, of small or comparatively small diameter. It is no unusual thing to find boilers of this type with several tons of brick and mortar piled on top, which load the boiler has to carry, in addition to its own weight, on two supports, perhaps at the extreme ends. In such cases the girth seams generally show distress near the center of the shell where the greatest strain comes. What is needed is some good light coverings, made in sections so that it can be easily removed without destroying it, for purposes of inspection, and as easily replaced.

PROGRESS IN CANNON MANUFACTURE.—Scarcely twenty five years ago the most powerful piece of artillery was a sixty-eight pounder, throwing its projectile with a velocity of 1,600 feet per second. Now the weights of guns have been increased from five to 100 tons, the velocities from 1,600 to 20,000 feet per second, the energies from 1,000 foot-tons to over 52,000, and the projections from 68 pounds to 2,000 pounds.

LAGGING IRON PULLEYS.—Cast iron pulleys may be lagged or faced with leather without the use of rivets, in the following manner: First brush over the face of the pulley with acetic acid, which will in a short time rust it and give it a very tough surface; then attach the leather to the face of the pulley with a cement composed of one pound of fish glue and one-half pound of common glue, cooked in alcohol and water.

PISTON RINGS should be turned inside as well as outside, so that they will not spring out of true when they are split. The time required to turn them inside is not one-tenth part of that required to turn them in the vise, if they warp in being split.

SCIENTIFIC PROGRESS.

Fallacy of the Present Theory of Sound.

To attack a theory which has been upheld for 2,500 years, and which is sustained by the greatest living scientists, is certainly a very bold undertaking. Prof. Henry A. Mott, Jr., E. M., Ph. D., of the New York College of Medicine for Women, comes to the fore and asserts that the commonly received undulatory theory of sound is false and does not account for many phenomena. Quoting from Prof. Huxley he says:

"Every hypothesis is bound to explain, or at any rate not to be inconsistent with, the whole of the facts it professes to account for; and if there is a single one of these facts which can be shown to be inconsistent with the hypothesis, such hypothesis falls to the ground—it is worth nothing." Dr. Mott takes up one or two phenomena in detail, and attempts to prove the fallacy of the present theory to account for them. Tyndall says: "When a common pendulum oscillates it tends to form a condensation in front and a rarefaction behind. But it is only a *tendency*; the motion is so slow, and the air is so elastic, that it moves away in front before it is sensibly condensed, and fills the space behind before it can become sensibly dilated. Hence waves or pulses are not generated by the pendulum." This is admitted by one of the highest authority on the current system of acoustics.

Mr. Mott gives some very interesting figures in regard to the sounds produced by the common locust. This insect weighs less than a quarter of a pennyweight, and can, by simply rasping its legs across the nervures of its wings (for this is the way its tone is produced), according to the wave theory, create a physical agitation and displacement of the air which converts four cubic miles of atmosphere into waves consisting of condensations and rarefactions. In these four square miles there are 16,000,000,000 square-inch columns of air, each exerting a pressure of 15 pounds in all directions—in the aggregate, 120,000,000 tons. Now since sound can only travel by means of air waves, consisting of condensations and rarefactions, it follows, if this theory be true, that this insect, by simply moving his legs, displaces all the particles of air constituting these 16,000,000,000 square-inch columns for a mile high, and restores them to their places again 440 times each second (its tone being very nearly A), and continues this process of thus charming the atmosphere for a full minute at a time.

When we apply the power exercised by the locust (that could not move an ounce of weight) to the membrana tympani of the human ear, we obtain still more interesting information. It is agreed by all scientists that if an ear were present in any part of the four cubic miles of air, the sound of the locust could be heard and the membrana tympani would bend once in and once out for each vibration, or 440 times in one second. The inertia to be overcome in doing this has been determined to be half a grain for each membrane. By a simple calculation it has been found that there is room enough in this area for 65,000,000,000,000,000 of these membranes, which would give a ponderable mass of 4,000,000,000,000 pounds which this small insect is able to throw into rapid vibration!

Another case is given. Imagine a locust stridulating in the center of a mass of iron one mile square. It is admitted that he could be heard, and about sixteen times quicker than in the air, by placing the tympanic membrane in actual contact with the iron. Now since a mass of iron is all thrown into wave motion whose amplitude will vary from 1-500 to 1-1,000 of an inch the iron must be moved at least to this extent, which can be proved by experiment. The mass of iron thus displaced would weigh not less than 720,749,040,612 tons! According to Dr. St. John Rossa "the presence of the membrane tympani, in whole or in part, is not necessary to fair hearing." Therefore the beautiful idea of the tympanic membrane vibrating once in and once out for each vibration and being hit harder to produce intense notes seems unfounded—the real use of it being to keep cold and dust out of the middle ear which might otherwise become inflamed or diseased.

A correspondent of a New York paper from which we clip the above says: Some of Professor Mott's deductions and proofs certainly seem very fatal to the undulatory theory of sound, but while he pulls down the theory it is perhaps a little unfortunate that he does not offer another in its stead. This, however, he proposes to do at some future date.

Although the wave theory of sound does not at present seem to account for some phenomena observed, yet it is certainly best to adhere to this old theory until another and better one which can explain all the phenomena of sound is put forth.

ACQUISITION IN INFANTS.—A correspondent of *Science* furnishes the following in regard to the power of infants in acquiring knowledge: "I recently tried teaching a 12-months-old baby to ring a common dome table-bell. Perceiving the little knob on top to be somehow concerned she fingered it clumsily, but could not learn to strike down on it accurately with her raised hand, though I forced her to do so many times. She made clumsy motions, but finally, half accidentally, she rang it. This was enough. She at once rang it repeatedly with great success. I took it away to test her memory, and the next morning she rang it immediately without suggestion, but had it for a moment only. She was then absent four days; on returning, she rang it at once."

LACQUER WARE.—A Japanese describes the lacquer process: The art of lacquering is distinctly Japanese in its origin, and it is already more than 1200 years old. The pieces made in those olden times are still extant. The raw lacquer, chiefly the *Sechime urushi*, is used for priming, with an addition of burnt clay dust, or fine stone powder, so as to produce a coating of utmost hardness. The prepared lacquer, after having been strained, is lightly transparent when applied in thin layers, and possesses a color similar to that of shellac; this transparency is occasionally increased by a small addition of drying-oil, which, by mere hardening, produces a sufficient glossiness of the surface, whereas the pure lacquer is mixed with cinnabar or pigment, red oxide of iron or Prussian blue, etc.

The black lacquer is prepared in the following manner: It is effected without any addition of solid particles, such as lampblack, or similar substances, but merely by stirring the crude lacquer for a day or two in the open air, whereupon it assumes a very dark brown color. Toward the end of the operation a small quantity of water which has been kept standing for a few days, mingled with iron filings or a gall-nut infusion, darkened by the addition of iron, is added, and the whole stirred again, until part of the water has evaporated; then the lacquer acquires more consistency. The addition of this water is said to cause the highest brilliancy and blackness of lacquer. Sometimes the colored lacquer is used when the final coating is required to be of transparent nature. Either the unmixed strained lacquer or that peculiar kind of lacquer which has been thinned by an addition of oil is used. The mixing of lacquer with hardening or coloring powders is generally effected by the lacquerer himself on a wooden board with a wooden spatula just before using it. Finally the thick moisture is forcibly strained through a piece of paper called yoshinogami. Should the lacquer become too stiff for use, some bits of camphor are crushed and thoroughly mixed with the lacquer by spatula, and then it becomes more liquid.

COMETS AND ASTEROIDS.—The year 1884 did not present a record of very numerous or brilliant additions to the cometary family. There were six comets which have some claim to a place on the list, although there are but two that can be definitely classed as new. The third of the series to put in an appearance was perhaps the most important—not for its size or brilliancy, however. It was a mere speck of a comet, but has proved to be a celestial rover of considerable interest. A study of its history and movements shows that in 1875 it ventured quite near the great planet Jupiter, by whose attraction it was forced out of its regular orbit and made to move in one quite new. This is not the first time a charge of this kind has been made against Jupiter. It has, in fact, quite earned the reputation which has already been given to it, as "the great comet disturber" of our solar system. The newly discovered asteroids of 1884 number nine, which increases the fall number of this prolific and anomalous class of celestial bodies to the total of 244. Of these, six were discovered by Palisa, of Venice; one by Knorre, of Berlin; one by Borelby, of Marseilles, and the other by Dr. Luther, of Duseldorf.

GIGANTIC CRYSTALS.—America has long been celebrated among mineralogists as the home of enormous crystals, and the prodigious individuals of apatite, beryl and other minerals, found have been the subject of wonderment. But for size, the crystals of spodumene exposed in the excavations upon the Etta tin mine, in Pennington county, Dakota, carry off the palm. Prof. Blake, reporting on the subject, is authority for the statement that one of these crystals is *36 feet in length* in a straight line, and from *one to three feet in thickness*. The cleavage is smooth and straight, but the lateral and terminal planes are obscure. Crystals from 5 to 20 feet long are numerous, and recline in all directions.

THE CATARACTS OF THE NILE are due to granite veins, which the river, while working a way through the sandstone, had been unable to destroy or remove. A little modern engineering and by dynamite would probably add 1,500 miles to the uninterrupted navigation of that river, and open up northern-central Africa to the direct commerce of the world, as the Congo will eventually open up the southern-central portion of that continent.

VASELINE is said to be a good preservative for eggs. The vaseline is melted with three per cent of salicylic acid and rubbed on the eggs after they are thoroughly washed. The coating so given may be renewed after awhile. As the air is thus thoroughly excluded, the eggs, if they are fresh to begin with, ought to keep good for a long time.

MAGNESIUM BY ELECTROLYSIS.—A large lump of magnesium has been shown by Dr. Frohich to the Berlin Physical Society as the product of an electrolytic industry, the process of which is based essentially on the melting of chloride of magnesium and decomposing it in the melted state by an electric current.

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Passing Events.

Public interest has been centered on the movements of the English and Russian shipments, with reference to the probability of war being declared. Preparations are being made by both powers, but no active steps have been taken.

The winter is about over and many mines are being started up that have been closed down. Moreover, the weather is such that the prospectors can again take the field.

In California more particular attention is being paid to the Northern counties, and Trinity, Sierra and Siskiyou will show up some good mines this season it is expected. No special news of interest comes from the New River mines. Roads and trails are being built, and many men are going in a lot and startliog developments have so far occurred. It is rather too early, however, for very much to be done.

MARIPOSA county has a mine, not on the Fremont Grant, which is reported as being a genuine honanza. It is the Deltz mine, which has long been worked. Lately, however, they have been working a decomposed streak of matter which lies on the footwall, and are workiog up the specimen stuff in hand mortars. We were shown some of this material this week. It carries very coarse gold. Some of the lighter portions can be washed, but part of it must be crushed in mortars. The specimens are very rich, and it is intended to have a mill to work the whole mass. A great deal of gold is now being taken out by hand mortars. The new discovery is iodependent of the main lode.

Retorting Gold Amalgam.

Ordinary iron retorts down to a very small size may be purchased of the dealers as assayers' material. These retorts, for small operations, are deep, cast-iron vessels with the top edge planed level, on which fits a cover also planed true so as to form a perfect joint. A tube opeos through the cover and bends downward. The cover is fastened by a clamp and set-screw. The amalgam is put into the retort and a luting made of a mixtnre of wood-ashes, clay and water is put thickly around the edge of the cover to stop any possible leaks. The retort is placed in a furnace over a modcrate fire, and the end of the pipe placed under the surface of water in a basin, pan or other convenient receptacle. If the fire is kept under proper control there is no need of covering the pipe, though it is often kept cool by being covered with cloth or a bag and water poured upon it.

When the amalgam bas been imperfectly cleaned the gold will sometimes stick to the retort, but this may be obviated by chalking the interior of the retort or putting a piece of common writing-paper under the amalgam balls. However, when the amalgam is clean and has been thoroughly worked over the gold will come out easily.

The State Mineralogist states that a very convenient way to retort is to drive two small stakes into the ground, and to fasten a small iron rod to each at a convenient hight; upon this the retort is hung and a fire of small wood is built around it. When the retort has attained a dull red beat and no more mercury distills over, the fire is put out and the retort allowed to cool; the cover is taken off and bullion removed. If the amalgam has been properly cleaned the gold will be found after retorting to be metallic in appearauce and of a gold color. It is ready for the smeltiug-pot a s soon as taken out.

It is never safe to open the retort before the gold is out, nor will it stand being cooled in water. Openiog a hot retort and inhaling mercurial fumes may give a man a good idea of an important run a little sooner, but no one will do it often. We are speaking of retor ing ou a small scale, and not in regularly built retort furnaces. Sometimes men try to clean improperly retorted amalgam with acids. Miners will occasionally wash amalgam as taken from the bags, first in diluted sulphuric acid and then with nitric acid, supposed to be pure, which is a treatment only the ignorant will give it. It is better to properly clean the amalgam and to flux off any accidental impurity on the crucible.

When there is iron in the amalgam and the latter is not properly cleaned before retorting, the bullion comes out black. When amalgamation is carried on in iron pans the iron will often enter the amalgam. It seems the iron does not come from the ore, but from shoes and dies of the pans. This iron amalgam seems only found in roasted silver ores and raw gold ores. It is very magnetic and the iron only loosely combined with the quicksilver, so that simple mechanical treatment, such as rubbing or grinding, is enough to separate the iron from the quicksilver, but this is too slow for practical work.

It may be stated that there are several different ways of treating this iron amalgam, but that described by the late Mr. G. Kustel is quick, cheap and perfect, and is as follows: A flat-bottomed pan like Knox's is put in motion without any water in it and a bucketful of sifted ashes introduced. The well-strained amalgam is then thrown in gradually, piece by piece, in proportion as it turns into powder. If the mixture assumes a dark color, or if the pulverization commences to go slow, another bucketful of ashes is added, and so on until about 300 pounds are pulverized, which is effected in about half an hour. The gray, heavy powder is then taken out and another lot of 300 pounds of amalgam managed in the same way, and so on. In case the ashes are moist a reaction in the mass is observed by the increase of temperature to a considerable degree. After the mixture is finished the powder is allowed to lay for an hour undisturbed, then some water admitted into the pan so as to cover the bottom about an inch deep. While the muller is in motion the amalgam powder is introduced by means of a scoop until about 300 pounds are charged. Water is added, if necessary, but not too much. Quicksilver is generally not required unless the amalgam was strained very hard. After a while the amalgam becomes more liquid by losing the iron, which blackens the water. After an hour's grinding some amalgam is taken ont and examined, and if not quite clean another hour will do. A quarter of au hour before the discharge more water and quicksilver is added—the quicksilver only for the purpose of easier discharge. It is not exactly necessary to work with charges of 300 pounds.

If the supposition is correct that the iron comes from the shoes and dies of the pan, then if a certain kind of ore is inclined to form iron amalgam this could he preveoted by omitting the grinding; but in treating raw gold ore the grinding is indispensable, and in this case if iron amalgam is formed an addition of ashes to the ore would probably keep the iron from entering the amalgam, as the ashes are the means of separating it. Treating silver ores, this last remedy could not be used for the same purpose, as too much of it would injure the amalgamation.

British Columbia Quartz.

We had a conversation this week with a gentleman who has been a resident of British Columbia for some years, and whose occupation as a surveyor has given him an opportunity to go over a good deal of the region. He states generally that most of the country is rugged and mountainous and is fit only for stock ranges, timbering and mining. Of the latter occupation very little is being done, as there are very few mining men there, and it seems difficult to get any one to take an interest in quartz mining, there being a general lack of enterprise. Just now the building of the Canadian Pacific is making matters a little brisk in certain portions of the region.

Our informant says that there seems to be plenty of ledges in the mountains, though very few of them have been prospected to any extent. The country is difficult to prospect in, on account of the dense growth of timber and the many streams. Moreover, when the beaten trails are left the prospectors have to cut trails for themselves through the timber and undergrowth.

We are told of the existence of a large ledge of quartz about twenty feet wide, and the croppings of which extend several miles. This mass of quartz runs down to the water's edge of an inlet, where it is deep enough for large ships to come. The quartz is filled with sulphurets, and by the help of concentrators it is thought it would pay well to concentrate and ship to this port for treatment.

The gentleman to whom we refer speaks also of a gold mine on Cherry creek, 60 miles from the boundary line and 40 miles from a railroad station, upon which a small shaft has been sunk and some very rich ore taken, yielding several thousand dollars. But when the vein pinched down thin it was abandoned. The ledges appear to be "pockety," and when a pocket gives out they are afraid to spend time or money in looking for another. He has tried to get parties to open the mine properly and see if the old class of ore cannot again be struck.

Some men are prospecting a claim on Burns mountain, Carboo, and a Colorado miner has found a ledge on Rock creek, at the headwaters of Kettle river, which runs into the Columbia below old Fort Caldwell. Little work has been done on either of these claims.

Our informant thinks there is a good field for prospecting, provided the men are suitably prepared. He says men want $500 or $600 each when they arrive in the country, and he is sure experienced men could find the ledges. Food is cheap, but at present there seems neither energy or capital in the country to he applied to mining. He thinks a man could live as miners do for $250 for a year. The mining laws have been simplified of late. When a ledge is found it is recorded at an expense of $2.50. This holds it for 30 days. The prospector may then pay $50 in cash and get a clear title to his claim of 1,500 feet by 600, and there is no distinction as to nationality of the miner. Or, if a man expends $1,000 in development he can, on proper proof, then get a title from the government by payment of $2.50 per acre.

SEVEN tunnels have been successfully run into the mountains in Los Angeles county, and water obtained for irrigation purposes.

Matte Roasting.

In working lead ores, whenever there is any sulphur in a smelting mixture it has to be alurated with the necessary quantity of iron to form a matte of the right composition. To extract the lead and silver which these mattes retain, it is necessary to roast or calcine, and afterwards flux and smelt them exactly in the same manner as ore. If they are so poor in lead that there is danger of its being entangled in the slag and thus lost, it is advisable to add plumbiferous ores or products in sufficient quantity to effect a complete separation of lead and slag in the furnace. A charge containing 10 per cent of lead will be safe to answer this purpose, yet it is possible to obtain the same result with as little as six per cent. The question now arises, will it pay to roast matte as a reverberatory, as it costs something to reduce it to powder besides the roasting itself? In the opinion of Mr. O. H. Hahn, a writer on this subject, if the matte is rich in silver it does; if not, then it requires close figuring of all expenses. The same authority, in speaking of roasting poor matte in heaps, says the only preparations needed were coarse crushing, a bedding of wood to pile it on, and setting it on fire. The crushing is easy enough after it has been exposed for a while to atmospheric influences, which cause it to crumble.

But the calcination is extremely tedious, as it will burn a month or more and then the whole pile will have to be turned over to assort the well-calcined stuff from a half-calcined and crude matte, from which a new pile or heap has to be formed. These manipulations have to be repeated till no more crude matte is left, and it will take months before that result is achieved. However well this matte may be roasted in heaps, it will always contaio from 7 to 8 per cent of sulphur, which in the following smelting operations will cause another matte to be formed. Mr. Hahn concludes that this mode of roasting is not worthy of imitation in a progressive country where time is an object, and most smelters take the same view. They are simply laying aside the poor mattes for a time when these may be reduced more cheaply and quickly than at present. Attempts to roast ore in this manner have been frequently made, but just as often discarded as tedious and imperfect. An ore which does not hear roastiog in a furnace should be left alone.

Coal Trade of the United States.

Although the general business of the country was in a depressed condition last year, the returns show an increase in 1884 of the coal production of the United States. J. E. Saward, of New York, has issued his usual "Local Trade" this year, which contains detailed statistics for all States and Territories for the year 1885 compiled from authentic sources. A recapitulation of the production of coal for the last two years is to he found in the following table:

States.	Tons, 1883.	Tons, 1884.
Alabama	1,400,000	2,000,000
Arkansas	75,000	150,000
California	200,000	200,000
Colorado	1,000,000	1,500,000
Dakota	50,000	50,000
Georgia	200,000	200,000
Idaho	10,000	20,000
Illinois	10,508,791	10,101,005
Indiana	2,560,000	2,260,000
Indian Territory	175,000	400,000
Iowa	3,881,350	3,903,458
Kansas	850,000	1,100,000
Kentucky	1,650,000	1,550,000
Maryland	2,206,172	2,269,051
Michigan	135,000	135,000
Missouri	2,250,000	2,500,000
Montana	50,000	50,000
New Mexico	250,000	350,000
Ohio	8,229,529	9,000,000
Oregon	60,000	60,000
Pennsylvania Anthracite	31,703,027	30,718,293
" Bituminous	24,000,000	25,000,000
Tennessee	1,000,000	1,200,000
Texas	100,000	125,000
Utah	250,000	250,000
Virginia	225,000	300,000
Washington Territory	260,000	200,000
West Virginia	2,805,565	2,300,000
Wyoming Territory	700,000	1,000,000
Totals	96,875,384	99,651,807

In these statistics California cuts a comparatively small figure, and even then we are of the opinion that Mr. Saward's estimate is altogether too high. The only productive mines in the State last year were the Mt. Diablo and the Ione mines. The Ione product is a lignite mainly used by local consumers, and very little of it finds its way to San Francisco. The Mt. Diablo mines only sent to San Francisco in 1884, according to Mr. Saward's and our figures, 77,485 tons, though there was, of course, local consumption and some supplied to river steamers. But it is not probable that the whole product was over 100,000 tons. Our main dependence on this coast is on the Oregon and Washington Territory coals, and those from Great Britain and Australia, which come in the wheat ships.

A Combined Vacuum Pump and Table Blow-pipe.

The apparatus here described was designed by W. F. Durfee, of Bridgeport, Conn., for use in the laboratory of the American Silver Steel Works. Mr. Durfee described the apparatus in a paper read before the American Institute of Mining Engineers. In the drawings Fig. 1 is a general elevation of the apparatus, the air-chamber being sectioned vertically; Fig. 2 a plan of the air-chamber; Fig. 3 a vertical sectional elevation of the vacuum pump, the section being on line C D, of Fig. 4, which is a horizontal section of line A B, of Fig. 3.

The vacuum pump is constructed of copper, and consists of a vacuum chamber, E, supported upon the upper expanded end of a vertical pipe, Q. The vacuum chamber is provided with four nozzles, C, F, I, D (Fig. 4), two of which are shown in section at A, B (Fig. 3).

Passing vertically through the center of vacuum chamber E is seen the water supply pipe P, whose lower extremity encloses an internal pipe p, which is supported and placed in communication with the vacuum chamber E by means of the two elliptical nozzles, n, n. The upper part of the pipe p is closed by a conical cap, and its lower end is in the same plane with the extremity of the water supply pipe P, within which it is placed.

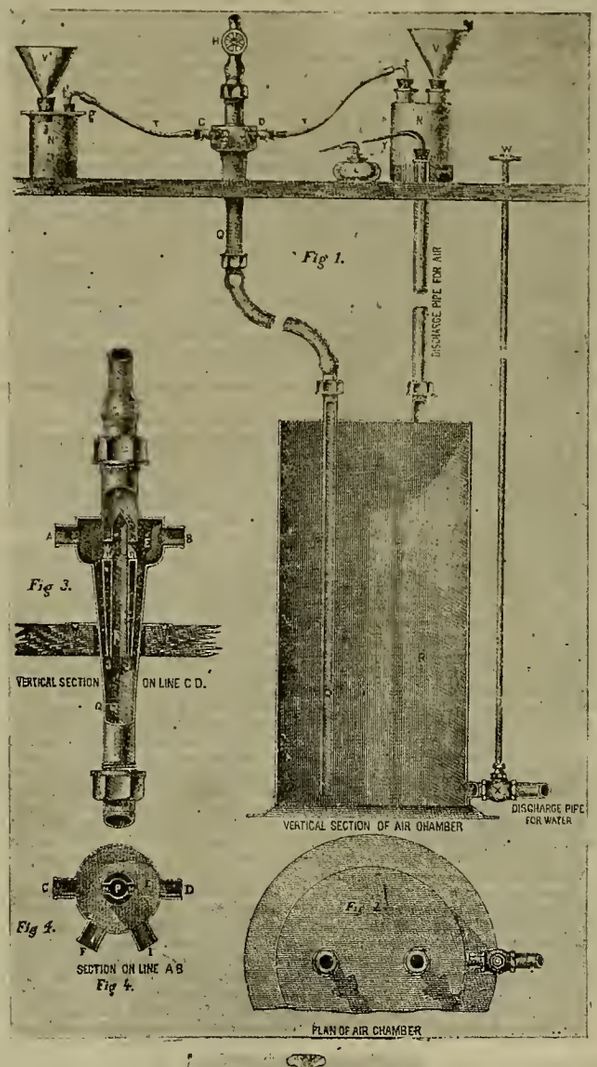
The relative sizes of the pipes P and p are such that an annular adjutage, one-sixteenth of an inch in thickness, is formed between their lower extremities, through which the water from the supply pipe P passes into the pipe Q, drawing any air that may be in the vacuum chamber E and the upper conical part of the pipe Q along with it, the air in the vacuum chamber E having free access to the interior of the hollow cylindrical jet through the nozzle n, n, and the internal pipe p.

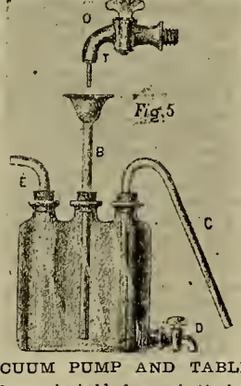
When the apparatus is used to facilitate the operation of filtering, either or all of the nozzles C, F, I, D, are connected by rubber tubes to the vessel which is to receive the filtrate. In Fig. 1 two kinds of receiving vessels are shown. That on the right consists of a common two-necked bottle, N, to whose right-hand neck is fitted a cork through which is passed the stem of a glass funnel V, containing the filter paper and the solution to be filtered; the left-hand neck is provided with a cork through which is passed the lower end of a bent glass tube, t, to whose outer extremity is attached the right-hand end of the rubber tube T, the other end being connected by a short glass tube to a perforated cork adapted to the nozzle D of the vacuum pump. The form of receiving apparatus shown on the left of Fig. 1, consists of a beaker, N, of common form, having its lip ground to an air-tight contact with a glass cover-plate, g, provided with two holes to which are fitted corks for the reception of the filter-funnel V', and the bent glass tube t', which last is connected to the nozzle C of the vacuum pump by the rubber tube T'. Whenever the apparatus is employed as a vacuum pump, such of the nozzles C, F, I, D (Fig. 1) as are not connected with the filtrate-receivers must be closed with cork stoppers, as are the nozzles F, I; the cork stopper in the upper end of the discharge-pipe for air must be removed, and the valve X, in the discharge pipe for water must be kept wide open. The adjustment of the apparatus allows the mixture of air and water, which is discharged from the vacuum pump through the pipe Q into the air-chamber R, to separate and pass away without resistance through the respective discharge-pipes for air and water. The rapidity and power of the action of the vacuum pump may be readily adjusted at will by means of the valve H (Fig. 1), which controls the amount of water admitted to it in a unit of time.

Having thus described the action of the apparatus when used to hasten the process of filtering, attention is now called to its use as a means of furnishing blast to a table blow-pipe.

In Fig. 1, the apparatus is represented (for the purpose of compactness of illustration) as acting, at the same time, as an exhauster and compresser of air, though in practice it is never used in this way. When it is desired to use it for the latter purpose, it is adjusted as follows:

The cork stoppers are removed from each of the nozzles C, F, I, D, thus allowing the air free access to the vacuum-chamber E (Figs. 3 and 4); the valve X, in the discharge pipe for water is partly closed, and a cork having a bent, tapered glass tube Y (Fig. 1), to serve as a blow-pipe tuyere, adapted to it, is inserted in the upper end of the discharge pipe for air. This tuyere pipe Y can be adjusted vertically, by moving it up or down in the cork through which it tightly passes, so as to adapt it to the hight of the blow-pipe lamp L. In case it is necessary to use the blast at a distance from the upper end of the discharge-pipe for air, one end of a rubber tube of any convenient length may be attached to this pipe, its other end being provided with a tuyere, which may be held in any suitable support, and thus the blast may be carried to any form of lamp or other heat-generator.





COMBINED VACUUM PUMP AND TABLE BLOW-PIPE.

The apparatus being adjusted as described, all that is required to put the blast in action is to turn on the water to the vacuum pump by means of the hand-wheel H (Fig. 1). The water, as it passes through the hollow cylindrical adjutage j j (Fig. 3), draws the air through the four open nozzles C, F, I, D, and carries it through the pipe Q (Fig. 1) into the air-chamber R, in which the air and water separate, the former finding an escape through the discharge-pipe for air and its attached tuyere, and the latter passing off through the discharge pipe for water. It is desirable that the air-chamber R should be located ten or twelve feet below the point of discharge of the blast, whose intensity is influenced to a great degree by the distance from the vacuum-chamber to the bottom of the air-chamber, as also by the pressure of the water supply through the valve H. The volume of blast may be regulated within its maximum limit by means of the valve H, and its pressure within the same limit by properly adjusting the valve X by means of the hand-wheel W.

Another form of blow-pipe apparatus, dependent for its action on similar principles to that already described, is illustrated by Fig. 5. It was first constructed by me in the year 1863, for use in the laboratory of the Steel Works at Wyandotte, Mich. It has the advantage that it can be readily arranged with the means usually at hand in any well-regulated laboratory. It consists of an ordinary Woolf bottle, A (Fig. 5), to whose central neck is tightly fitted (by means of a cork through which it passes) a funnel-tube, B, extending nearly to the bottom of the bottle. To the right-hand neck is fitted, in a similar way, a syphon, C, whose inner end nearly touches the bottom of the bottle. (In case a two-necked bottle having a tubulation on one side is available, a small cock, as shown in dotted lines at D, may be substituted for this syphon.) The left-hand neck of the bottle A has adapted to its cork a curved pipe E, to which may be attached a rubber tube for conveying the air delivered by it in any desired direction, for use in a blow-pipe or other apparatus. When it is desired to put the apparatus described in action, it is placed under a hydrant cock, O, which is provided with a glass tube, T, slightly smaller in diameter than the funnel-tube B, and through the tube T a regulated stream of water is discharged into the funnel-tube. This stream will draw down with it into the bottle A a large volume of air, which, separating from the water is discharged through the pipe E, while the water finds its escape either through the syphon C or the cock D, as the one or the other is used in the construction of the apparatus.

Product of English Mines.

Official statistics show that the weight of mineral produced in Great Britain last year was 174,148,319 tons, a reduction of about four and a half millions of tons from the preceding year. An abstract of the statistics shows the following results:

	1883. Tons.	1884. Tons.
Coal Mines Regulation Act.		
Minerals raised.		
Coal	163,737,327	160,044,175
Fireclay	2,189,452	2,046,567
Ironstone	11,495,401	10,408,467
Shale and other minerals	1,341,210	1,648,610
Totals	178,763,390	174,147,819
Number of persons employed	514,933	517,623
" fatal accidents	921	863
" deaths occasioned thereby	1,054	942
Metalliferous Mines Regulation Act.		
Number of persons employed	50,235	44,120
" fatal accidents	68	54
" deaths occasioned thereby	86	56

Although the amount has fallen off by upwards of four and a half million tons, the number of persons employed has increased from 514,933 in 1883 to 517,623 in 1884. On the other hand, fatal accidents and the deaths caused thereby have both diminished, the accidents from 921 to 863, the deaths from 1,054 to 942. The returns under the Metalliferous Mines Act only give the number of persons employed, the fatal accidents and the deaths. In each case there is a marked decrease. The proportional reduction in accidents is even greater; for, whereas there were 68 fatal accidents in 1883, causing the deaths of 86 persons, there were 54 fatal accidents, causing the death of 56 persons in 1884. Thus, while the number of persons was reduced by about 12 per cent, the fatalities caused to them decreased by about 35 per cent.

The fact of a reduction of product is unprecedented, for the gain has been steady. Former years have indicated steady advances in the demand. The causes which have led to this most exceptional state of things are far less conclusive than is the state of things itself. Yet they are all important, both to the coal mining industry and also to the nation. Few thoughtful men are without uncomfortable apprehensions as to how that wealth is to be husbanded certainly till the nation has discharged its liability to its creditors. Some of these even talk of an export duty on coal, while at the same time abundant reasons can be brought forward why this should not be done. Thus, millions of tons each year must be reducing the stores of fossil fuel at a very rapid rate.

Nova Scotia Mines.

In Nova Scotia, in the matter of gold mining, the returns show that 118,087 days' labor were performed, and 25,147 tons of quartz were extracted and stamped, yielding 16,079 oz., 14 dwt., 10 grains of gold during the year 1884.

The average yield was 12 dwts., 18 grains per ton of quartz, etc., stamped; this is 1 dwt., 21 grains higher than the average for 1883, and is partly due to the lessened amount of low-grade ore stamped in Sherbrooke.

Several large lots of low-grade ore have been profitably mined, among them may be named 9,799 tons at Salmon River, yielding at the rate of 6 dwts., 25 grains per ton, and 1,579 tons at Renfrew, yielding at the rate of 6 dwts., 18 grains per ton. The richest yield the returns show is 2,212 oz., 8 dwts., from 913 tons of quartz, stamped by the Gallagher Gold Mining Company, being an average of 2 oz., 8 dwts., 10 grains to the ton.

The Parrott Silver and Copper Mining Company, Montana, has reduced its force on account of the low price of copper rendering the reduction of their ores unprofitable. No ore has been taken out since January, and only one reverberatory furnace is running and making a general clean up. They formerly worked 400 men, but are now working about 100.

Combined Amalgamation and Concentration of Silver Ores.

W. McDermott, of New York city, read the following paper before a recent meeting of tbe American Institute of Mining Engineers:

It is well known tbat many so-called free-milling silver ores are so classed more from their value necessitating a cheap process than from a real adaptability to raw amalgamation. Such low-grade ores, carrying more or less sulpburets, are more profitably treated by a cheap rapid process than by tbe more effective but costly process of roasting and amalgamation. Tbe tailings are sometimes crudely concentrated, or, after lying and becoming partially oxidized, are again worked in pans. Of late years, by the use of improved methods of concentration, many of old low-grade tailing-piles have been reworked to a good profit; and in some improved mills arrangements are made to concentrate before or after amalgamation, tbus making a single treatment in mill suffice.

It is self-evident tbat on a low-grade ore a small increase in percentage saved is of no commercial advantage if accompanied by a material increase in cost, and therefore a cheap and continuous system of work is the real necessity if a fair eaving is to be effected. As an illustration of tbe possibilities of combined concentration and amalgamation on some ores, tbe following

Results of a Working Test

At tbe New York Ore Milling and Testing Works will be of some interest:

The ore treated was a hard white quartz from Mexico, carrying a very small peroentage of finely divided sulpburets, chiefly iron pyrites. The original average assay was 35.5 oz. silver and 0.125 oz. gold per ton. The ore was stamped wet throngh a 40-mesb screen and passed direct to the Frue vanner. The concentrates produced were about one per cent of the original ore, *i. e.*, 100 tons into one.

The concentrates assayed 1,397 oz. silver per ton, and 5.2 oz. gold per ton. The tailings from the vanner assayed 16.4 oz. silver per ton and 0.05 oz. gold. The tailings were run into a settling tank and afterwards worked by a regular pan-amalgamation, yielding bullion .858 fine, and tbe settler-tailings assayed 4.1 oz. silver per ton with a free trace of gold. The combined process yielded, therefore, about 89 per cent of the assay value. In this test about one-third of a ton only was operated on and a certain quantity of ore remained in the battery which was weighed and assayed and proved to be concentrated to a value of about $100 per ton in gold and silver. It may safely be assumed that the precious metals which coucentrated in the battery would in regular runnlng be found in the concentrations and bullion to the same percentage as tbose in the discharge of tbe battery. But should this method of calculation be objected to, the following figures based on actual yield of test are reliable:

Bullion value in original ore by assay,	$14.51
" " of ore left in battery,	3.41
" " " " discharged and treated	$11.10
" " concentrations by assay	$5.77
" " bullion from pan,	3.81
" " total yield,	$ 9.58
Loss by difference,	$ 1.52
Bullion yield of settler-tailings by assay	$ 1.42

Of course it is not possible to clean up accurately in a small test either the few pounds of rich concentrates, or the small quantity of bullion from the pan; but a substantial agreement of yield witb the differences between assay of original ore aud tailings justifies confidence in the result of the test. The samples of tailing from both concentrator and settler were taken by automatic sampling machines, and the settler-sample was further checked by a sample taken from the pan just before discharge. These points are mentioned as an excuse for basing calculations as to working proceeses on so small a test, in which, however, it is to be noted that the actual operation was exactly the same as it would be on a large scale. Tbe stamp battery was fed by automatic feeder; the concentration was automatic and similar to that in any gold mill; tbe pan charge wes run but eix bours with a small quantity of bluestone and salt. In speaking of the

Percentage of Value Saved

As 89, two assumptions are made, viz.: first, tbat the residue in battery was from the fact of its concentration as susceptible to treatment as the discharge of the battery; second, that the contente of the rich concentrates constitute a final product. These assumptions are correct enough for the general purposes of this paper. The percentage of loss in subsequent reduction is of course very small per ton of original ore crushed. The additional cost of concentration in a properly arranged mill for amalgamation is extremely small, ae it necessitates even in a 40-stamp mill not more than two extra men in 24 bours, witb a consumption of hut trifling power. If continuoue amalgamation he employed, the whole process is of course cheapened etill more. The process is adapted to low grades of ore, carrying sulphurets, wbich it is not advieable to roast; and even some higher grades, under certain local conditions, will yield better commercial results tban by any procees involving a preliminary roasting. The disposition of tbe small quantity of rioh concentrates is determined hy local conditione; the product can either be roasted and put through the pane, smelted with other ores or sbipped to reduction works. The roasting of a small, rich product is of course a very different matter to roaeting the whole of the crude ore, and can be done in a small, cheaply huilt reverberatory furnace. Where tbe ores and local conditions favor, raw leaching by tbe Russell process can take the place of amalgamation, leaving tbe same work of utilizing the snlphurets to the concentrators.

Hours of Labor.

The Societe Industrielle of the nortb of France appointed recently a special commission to inquire into the probable consequences of tbe proposed reduction of the hours of labor in textile factories. The working-day in these factories now consists of twelve hours. In the interests of tbe workpeople, efforts have been made to shorten the day to ten hours. The commission heard evidence oa tbe spot from all tbe parties interested in the question, and in the recommendations appended to tbeir report tbey pronounce decisively against the change. They are of the opinion that in tbe face of Englisb and German competition the hours of labor cannot be shortened. They point ont tbat tbe proposed change would injure rather than benefit tbe workpeople, inasmucb as tbe rate of wages could not be raised to compensate the ehorter day, and consequently tbe week's earnings would be proportionately diminisbed. And they furtber add that experience shows tbat much of the spare time thus gained would, in the present social conditions, be spent in public bouses, to the detriment botb of health and wealth. Just now, when the colliers are agitating for a further reduction of the working-day, which, by the way, is now mucb shorter for them than for the factory bands, these utterances of the commissioners are worthy of careful consideration; and tbe misguided followers of the Basly herd would do well to ponder over them to see how far they are applicable to their own case.

With respect to the length of the working-day, a recent debate in the German Reichstag is particularly interesting. The disclosures made on that occasion by the supporters of the measurc for prohibiting work on Sundays and holy days, and for relieving overworked women and children, enable us to obtain a glimpse of the causes which have rendered German competition so formidable. It appears that in some industrial localities the working day is more than twelve hours long. In the Dusseldorf district it consiste of thirteen hours; in that of Treves and Aix-la-Chapelle from tbirteen to fifteen hours; and in Franconia it attains the wearying length of sixteen honrs. It was also pointed out incidentally during the debate that in many industries women and cbildren, on account of their lower rate of wages, were more and more supplanting men in their occnpations. These also are important facts wbich the working men of the rest of Europe would do well to consider. It should be borne in mind, too, by the British workman, tbat the wagee of the German are lower than his own. With sixteen bours of labor a day and no Sundays or holy days, the German toiler is surely safe from the destructive influences of the public house.—*Colliery Guardian.*

Mine Leasing.

The lease system of working mines continues to grow in favor in this section. We know of a number of experienced mining men who are figuring with mine owners for the lease of propertics tbat have been idle for some time, hut which, nnder careful and economical management can he made to yield handsomely to lessce or lessor. There are a large number of properties in Altusas county that show fine bodies of ore, but the grade is too low to leave a margin to tbe shipper unless the closest economy is observed. It is in the observance of tbe strictest economy, in that close attention to detail that lesseesexcel. As a rule, he works himself, and when not working, can be fonnd nevertheless, carefully supervising tbc work. The owner, on the other hand, generally leaves the work of snpervision to a high-priced superintendent, and the profits from the ore go into his pocket. The majority in this country undergoing development at present are in tbe hands of lessees, and without exception all of tbem are making money. Tbis, too, in the faoe of the fact that in several instances tbe owners actnally lost. In addition to the profitahle workings of such properties, a wholesome lesson is taugbt to the average mine owner, and that is, that economy is as mucb of an essential to succeseful mine working as it is in any branch of business. There are some few mines that can etand an expensive management and still leave a profit to the owners, but the majority of properties are not of this kind. The advent of the lease system is significant. It means the employment of a greater number of men and more proeperous times.—*Inter-Idaho.*

THE miners at Candelaire, Nevada, on learning that eome Chinamen were engaged stripping the ledge on the surface of the Victor mine, a meeting of tbe citizens was called and a committee eelected to wait upon the superinteudent and tbe president, informing them that Chinese lahor as miners would not be permitted. Tbe men afterwards went to the mine, but no Cbinamen were found tbere.

Idaho's Mining Districts.

From an article in the Idabo *Keystone* we take the following:

There is a good reason to believe tbat Idabo is just entering upon a season of development and prosperity that must advance the whole Territory as well as each individual interest. All over the Territory the outlook is good and improving. A number of new mining camps are coming into prominence, and some of the older ones are taking on new and apparently permanent life. Nearer home we might mention (ontside of Wood River) tbe Vienna camp, which bas seeu a number of new strikes the past six months, and more and better developments in the old mines. The camp is prospering, and tbe mine owners and mining companies are sanguine of a bright future.

Atlanta, through the changes in ownership of some of the old mines there, and tbe erection of additional mills and machinery, is destined to be a great gold and silver producer for at least a term of years.

In Custer county tbere is a continued mining prosperity, and while the old mines show no signs of failing, new strikes of rich ledges are common. Bayhorse is 100 per cent better today tban a year ago. The mines continue to yield abundantly of rich ore, and it is now shown beyond a doubt that the miues go to the deep. Newstrikes bave beeu made in the mines at Custer, and new discoveries are numerous and promising. The ore already in sight there gives assurance of years of production of the precious metals.

Lost River country, with its numerous mines, its wonderful area of rich farming lands and vast cattle ranges, cannot help advancing in wealth and prosperity.

Lemhi county is not behind in mining stock and agricultural progress. Some gold and silver quartz fields are being opened and machinery put in. On the Salmon river, below Salmon City, tbe new gold mill of tbe Kentuck Compauy is working successfully, and the Moose Creek and adjoining districts are coming out under development.

To tbe northwest we have the Stanley Basin country, in which new companies made discoveries last year that will pay well to work, and work has already commenced tberc. Still further nortb, along the foot of the Sawtooth mountains, ie the new Buckskin district—ten miles from Cape Horn, where some rich silver quartz ledges were opened last season.

Twenty-five or thirty miles still further to tbe northwest is the new silver-lead district of Sheep mountain, comprising about 30 locations, upon whicb marketahle ore has been found. Last season several of the claims employed pack-trains for transporting ore to Bayhorse—80 miles—and also to Ketchum smelters—120 miles distant. About 25 miles further in the same direction a new silver and gold quartz district was found late in the season, and the best quality of the ore assayed nearly $300. It is believed by prospectore to be a ricb district.

On the other side of the mountain we have increased activity in the old camps of the basin, wbile in the neighborbood of the Seven Devils country rich gold, silver and copper ledges of enormous size and wonderfully rich, are being developed. This of itself will make a very populous and active district eveu this season, as mucb of the ground is going into the hands of men able to erect smelters and mills.

The old Banner district is not behind either, in progress. New macbinery and new strikes put tbat camp on a permanent basis again as a bullion producer.

Thus we might go on, with column after column, describing new camps and new strikes in old camps, but a glance only is necessary to show that Idaho is entering upon a year of prosperity not equaled in any of our sister States or Territories. And as mining advances the farming and other interests also advance and prosper.

Coming nearer home, we have the new camp of Lava Creek, on tbe edge of tbe mountains bordering the Snake River plains, and near the stage road leading from Wood River to Arco. The ores are milling quartz, rich in chloride, or horn silver. A new town is being built there. Tbe ores average higher tban do those of any district yet discovered in Alturas county—at least so far as development has progressed.

A few miles from Bellevue, on Camas prairie, is a very extensive belt of gold-bearing quartz. A gold mill has been purchased for the mines there, and before fall a new camp will he added to tbe metal-producing districts of tbe Wood River country.

The mines on lower Wood river are well known and need no mention bere. In the immediate vicinity of Ketchum work will progress about the eame as last year. Some new prospect may be opened, and more ore put in sight. Up Warm Springs creek aud on Smoky a number of companies will be operating. On Trail creek there are numerous veins, some of which carry high-grade ore and considerable of it. On Eagle creek, Lake creek, Boulder and the districts on that range and helt, tbe oree are of a sbipping grade, and the veins more regular than in some of the districts of Alturas county.

It is underetood that Galena will see more work going on and more development in progress tbis season than for eeveral yeare past. The owners of Sawtootb properties likewise intend to push work on their mines this season, and tbat will be a more populous camp than since the firet year or two of its discovery.

Take it all in all, we believe tbe whole Territory will advance rapidly this season. Ketcbum being in tbe midst of an extensive mineral field, and to whicb many others mentioned are tributary, sbould be the most prosperous city in tbe Territory for many years to come. We have smelters, sampling works, a railroad, an enterprising, industrious population, and there is no visible obstacle in the way of her advancement and permanency.

A SIERRA COUNTY TOWN.—It is believed that Sierra City, in Sierra county, will, before another year, become one of tbe liveliest mining camps on tbe coast. From all indications that result is not at all unlikely. There is more prospecting now being done in that vicinity tban at any other time in tbe history of the camp. Good authority has it that first-class mining men are keeping an eye on the place, and already they are beginning to take hold of a number of the claims which have recently come to light; and others are bonding properties which bave lain idle for years, because tbe owners bave not possessed the means to develop them, but whicb were known beyond a doubt to be good paying claims. During the past six or eight months a new prospecting fever seems to have broken out among the inhabitants, and the business men as well as the miners seem to bave caugbt the plague. In fact, this fever owes its origin to the marvelously rich strike (now known as the Young America mine) made by Oliver Sunderhaus and Wash. Hughes a number of months ago. At the time the strike was made a well known business man of Sierra City offered a full-stocked grocery establishment, valued at something like $15,000, for a one-half interest in the mine, but the offer was rejected. Tbe gentleman has since, however, come into possession of a portion of the claim. The Young America lays just bebind the Sierra Buttes mountains, nearly 9,000 feet above the sea, and is on a line with and about one mile from the famous Sierra Buttes mine. This "find," togetber with others wbich have been made since, and the starting up of a number of tbe leading mines, among them the Columbo and the Marguerite, promise well for the future outlook of the place, wbich is said to have almost doubled in the number of its business houses in the past two years. And the end is not yet.—*Nevada Transcript.*

GO PROSPECTING.—The season of the year has come when prospectors can with safety, so far as the elements are concerned, go prospecting. During the present month we are liable to have some blustering weather, but the probabilities are there will be noue severe. Eastern Nevada abounds witb opportunities for those in search of either quartz deposits or placer diggings. Scarcely a week passes but that we hear favorable news from new as well as old sections. It is not absolntely necessary for a man to search for entirely new fields, inasmuch as there are many producing and promising sections witbin 100 miles of Eureka in which a man who will work and take a few chances would undoubtedly do well. It is folly for such men to lie around waiting for sometbing to turn up, as it may tbe three, and agaiu it may be six months, before there ie a demand for tbeir labor. Besides, is it not better for a man who is a good judge of ores to go prospecting—if he exercises the same judgment and thrift which is necessary for success in any business—than to be striking a superintendent or a foreman for a job? Such men wben they thus strike out show an independence which is commendable, and it is generally tbey who come out on top in the end.—*Eureka Sentinel.*

LEACHING.—Mr. Bailey, who is in partnership with Nesbitt and otber parties at Silver Reef in leaching the Leeds tailings, spent several days in Bullionville during the week familiariziog himself with the process as conducted by Mr. Russell. Mr. Bailey is leacbing the Reef tailings on the "Russell process," and working them np to 45 per cent, and expects to do better, as they contain no base metals worth speaking of. As the Reef ore is free milling and costs only a trifle for crnsbing, and as tbere are thousands of tons of it that will assay from $15 to $25, Mr. Bailey seems confident that leaching will eventually take the place of the amalgamating process, in whicb case the gentleman predicts many years of prosperity for tbat camp.—*Pioche Record.*

THERE will be no Exposition tbis year at Denver. The ventnre has been au unprofitable one from the start, and it ie not probable that tbe present management will ever again attempt to throw open the doors of the bandsome building for the purpose for which it wae erected. The people do not realize the valne and importance of an exhibition of onr mineral wealth, and it will be necessary to educate them up to tbe proper standard before another and successful Exposition will be possihle.—*Rocky Mountain Mining Review.*

A DISPATCH from Quijotoa (A. T.) saye: A rich strike was made to day at Covered Wells. Samples of ore assayed go up in the thousands. The town is greatly excited. Construction of the mill will be pushed as fast ae possible. Lumber has been ordered for a tramway and work will be commenced in a few days.

BRICK-MAKERS from Salt Lake are expected in Bullionville in about a week. It will take about 350,000 brick to build the Stedefelt furnace that the leaching company is going to erect.

Disturbances in Trade and Industry.

The present is an era of great disturbances in trade and manufactures, and of commerce as well. New processes and new machinery often work complete revolutions in modes of manufacture. New and changed means and rates of transportation often remove important centers of trade from one point to another. Steam has almost entirely extinguished many handicrafts, and is most economically applied to almost every department of industry from that on the largest possible scale to that of the most minute and intricate. Within a few months even, fingers of iron and steel have been most successfully applied to the intricate, and until now, seemingly impossible process of picking cotton in the field. Industrial concentration is perhaps above all the rule of the age. Steam is its chief aid, and every development aggravates the general tendency to aggregation—to the concentration of business in large and larger establishments, and the consequent extinction one after another of the smaller. Trade is monopolized, not necessarily by great capitalists, but by great capitals. In every trade the standard of necessary size, the minimum establishment that can hold its own in competition, is constantly and rapidly raised. The little men are ground out, and the littleness that dooms men to destruction waxes year by year. Of the cotton mills of last century a few here and there are standing, saved by local or other accidents, while their rivals have either grown to gigantic size or fallen into ruin. The survivors, with steam substituted for water power, with machinery twice or thrice renewed, are worked while they pay one-half or one-fourth per cent on their cost, rather than abandon a property utterly unsalable. The case of other textile manufactures is the same, or stronger still.

Steel and iron are the monopoly of gigantic foundries. The chemical trade was for a long time open to men of very moderate means, but recent inventions threaten to turn plants that have cost millions to waste brick and old lead. Where monopoly or aggregation fails, trade agreements step in, temporary in their nature, but, while they continue, oppressive to the last degree to the people. Immense plants of machinery and expensive appliances are kept idle, at large yearly payments for their idleness, in order that others may reap larger profits; but the people have to pay the interest on both the moving and idle machinery, in addition to the greater profits thereby enjoyed by the former. Fleets of steamers are often thus laid up, and railroads subsidized to refuse freights from certain points.

Every year, and in almost every important locality in the Union, these things happen to one or another of our larger or minor industries.

Until quite recently the retail trade has been the resource of men whose character, skill and thrift has enabled them to dispense with large capital. But of late even this branch of trade, which gave remunerative employment to so many of our people of small means, has been superseded or monopolized, more or less, by large capitalists with vast and skillfully organized establishments, with which men of smaller means, however diligent, honest and capable, could not successfully compete.

Thus it is that year by year the big fish are eating up the little ones—the rich are growing richer and the poor poorer, until the promise of the early future is a distinctive division of society into two grand classes—the rich and the poor, with few or none to represent the great conservative class of well-to-do people, upon whom now rests the responsibility of keeping up a healthy equilibrium in the body politic. These facts afford much food for thought, in view of the grave consequences which may result from modern innovations in industry and trade.

How to Retain Good Workmen.

How to retain good workmen in a machine shop, or anywhere else, indeed, is an important question. An exhibitor at the late Philadelphia Electrical Exposition drew much attention to his exhibit, by posting up this question in a conspicuous manner at his stand. It was answered by a short circular which he distributed to his callers, the gist of which was that the proprietors of the works should always supply their workmen with good tools and convenient appliances and other facilities for working. This is one of the very best means of always securing and keeping good workmen. He might with equal justice have added that similar means greatly increase the production of a shop, and have the effect not only of keeping the men satisfied with the place, but of providing the owner with the means of paying the men their wages and of maintaining a balance on the right side of his ledger. When the proprietor of a machine shop gives his men poor tools to work with he cannot complain at their producing inferior work. Inferior work habitually turned out of a shop soon stamps its character on the establishment, and that entails certain loss of orders. A gentleman, closely identified with extensive machine works, says that it paid him to renew a tool by the time it had been in use ten or twelve years. If more machine shop owners were imbued with this sentiment, there would be fewer tumble-down "old established" shops around, and the machine business generally would be in a healthier condition.

USEFUL INFORMATION.

Imitations of Leather.

"The oft-quoted statement," said a veteran shoe dealer to a reporter, 'There are tricks in all trades but ours,' is the completest fallacy ever perpetrated upon an unsuspecting public. The fact is that there is no given trades in which frauds are not continually conjured and successfully worked. I will tell you a few in our business, for I am best informed on the subject, having been in the wholesale manufacturing trade for a score of years. Right here let me tell you the cause of it. In any business there is a continual struggle between manufacturers, and this makes it necessary for them to economise and figure to reduce cost in the most trifling details, for it is the few cents margin that makes the profit which enables the fortunate to wear diamonds and drive fast horses.

"Some years ago there was a rage for cheapening goods. Cheap substitutes for standard stock were eagerly sought for. They found them, too. A prominent manufacturer here, who has a good reputation, and does a business amounting to hundreds of thousands annually, devised a scheme some time ago which was destined to make big profits. The advantage is the extra protection to the toe, making two thicknesses of leather there, and especially in children's shoes. Well, this man cut a piece off the vamp at the toe, and joined the vamp and tip by stitching them as usual. The result was only one thickness of leather there, and when the tip was worn through there was a hole in the shoe."

Vegetable Leather.

A vegetable leather has been produced by M. Bauer, L. Brouard and J. Ancel at Paris; it is said to be fully equal to leather, and a non-conductor of electricity and waterproof. It is a proportion of 3 kilogs. gutta percha, 900 grams sulphur, 1 kilog. raw cotton, 600 grams white zinc, 100 grams kolkothar, and 250 grams oxide of antimony. The mixture is then vulcanized similar to rubber. Gutta-percha and sulphur are necessary ingredients, while the other parts may be replaced by chemicals of similar character. The quantity of the various ingredients may be varied to suit the purposes.

Another method for preparing an equivalent of leather is the following: Animal albumen, either alone or with some dextrine or gum, is mixed with glycerine, fat vegetable oil and a concentrated solution of india-rubber. This mixture, if desired, after dyestuff is added, is poured upon level plates and left to harden, after which the layer is put on a stretching frame and dried at a low temperature. The stuff is finally tanned like leather by submerging it in liquid tanning stuff for a shorter or longer time.

Spiders and their Peculiarities.

A recent German scientific journal gives some interesting notes upon spiders by F. Dahl. He claims that their sight is imperfect, except at very short distances; and, in consequence of this, their sense of touch is so well developed that when an object falls into their net, they can tell upon exactly which radius the object has fallen, though to ascertain this they must first go to the center of the web, even though the object may have fallen near their original position. Their smell and hearing are also excellent, the former so much so that they can distinguish odors. The remarkable instinct possessed by the geometrical spiders is shown by the fact that the first web made by the young is perfectly geometrical. That they reflect, is proved by the fact that they despise certain kinds of tough, chitinous insects, which they have unsuccessfully attacked before. This reflection is to be distinguished from the instinctive dread which they have for bee-like flies.

In regard to the voracity of the spider another journal gives the following: A spider, by a careful estimate made by means of actually weighing it and then confining it in a cage, ate four times its weight for breakfast, nearly nine times its weight for dinner, 13 times its weight for supper, finishing up with an ounce, and at 8 P. M., when he was released, ran off in search of food. At this rate a man weighing 160 pounds would require the whole of a fat steer for breakfast, the dose repeated with the addition of a half dozen well-fattened sheep for dinner, and two bullocks, eight sheep and four hogs for supper, and then, as a lunch before going to his club banquet, he would indulge in about four barrels of fresh fish.

A PECULIAR WHEAT TEST.—A peculiar case of wheat testing is made known by Mr. Groat, emigration agent of the Northern Pacific. He sent samples of a fine appearing grain raised near Jamestown, Dakota, from a new Russian seed which yields 40 bushels to the acre. Two samples were sent to Minneapolis and a third was submitted in St. Paul. The three reports agreed in declaring the wheat worthless. The inspectors knew nothing whatever of the origin and character of the wheat, or that other inspections were being made, but each of the reports was the same. The grain was declared to be brittle and below grade. In the bulk it bore such a resemblance to No. 1 hard that it might easily have sold for that grade to an unsuspecting buyer. It is purely an experimental wheat and was so submitted for test. The unanimity of the inspectors can leave no doubt as to its true value.

SOUND ADVICE.—The American Iron and Steel Association gives the following advice to workingmen, which is worthy the thoughtful attention of all classes of people:

Begin now to save where you can; resolve to wear the old coat another winter; leave the buying of expensive roasts and tenderloin steaks to those who can afford them; learn to distinguish between food that is cheap and nourishing and food that is high in price; if you cannot afford a visit by railroad to a far-off cousin or other relative, who has enough to do to take care of himself, stay at home; home is the best place anyway. Cease copying the ways of the rich; all cannot be rich; keep in your station, but honor it; respect yourself by not pretending to be better off in this world's goods than you are; shun the grogshop, and, if you must be a slave to tobacco, let this slavery take as little money from your pocket as possible. Whatever your wages may be, don't fool them away. Take them home when earned, and thank Providence that the enterprise and skill of others have given you the opportunity to earn even low wages, so that you may have even a humble home. Be thankful for what you have and be cheerful. Don't grumble, don't drink fire-water, keep at work, save the pennies, and you will get along. This is a goodly land, and if there is anything wrong with the industries of the country to-day, it will be righted by and by.

OIL-STONE POWDER FOR GRINDING PURPOSES.—Although modern practice discards as far as possible the grinding together of surfaces where accuracy of fit is required, because the abrasive power used, particularly emery, is apt to get imbedded in the metal, and then it will continue to grind, and of course ultimately deteriorate the fittings. Pieces of oil-stone finely pulverized, sifted and washed, are used by mathematical instrument makers in preference to pumice-stone powder for grinding and polishing superior brass or gun-metal work. It is also used by watchmakers and mechanicians on rubbers of pewter, for polishing steel, as well as in slips or square pieces a few inches long, used after the manner of files.

NAILS IN A POUND.—It is said there are ten more nails in a pound of 8-penny iron nails than there are in a pound of 8 penny steel nails. If this is true there would be 1,000 more nails in a keg of 8-penny iron nails than there would be in a keg of steel nails. The count is said to have been made at Wheeling.

PLATING SMALL PIECES WITH BRASS.—Dip them in a solution of six grammes sulphate of copper and six grammes chloride of tin dissolved in one liter of water. Or dip them in a solution of 9½ grains sulphate of copper and 9½ grains chloride of tin dissolved in 1½ pints of water.

THE FIRST SHIPMENT OF COTTON.—The first appearance of cotton as an article of commerce was a shipment of seven bales from Charleston in 1757. In 1880-81 the crop was 6,000,000 bales. The yield of 1884-5 was about 7,000,000 bales.

GOOD HEALTH.

Cancer, Malaria and Consumption.

These three above named and other dreadful evils are much discussed by press and doctors of to-day.

1st, Cancer. My father had what the doctors all agreed was a cancer on the back of his hand. It continued growing for years, but was finally cured, and he is now young at 80 years of age and no trace of cancer left. The method of cure was as follows: He procured a large lot of sheep sorrell, bruised it and pressed the juice into a quart bowl. This was placed on the stove till evaporated down to one-fourth of an inch thick, forming a plaster to cover the cancer. After two days of severe pain he took off the plaster with the cancer and its roots, that no knife could have reached without greater injury.

2d, Malaria. I use the simple old remedy—thoroughwort (boneset). I send to Illinois in July and have the flowers and leaves gathered. Take enough to make a tea of a pleasant bitter, and when cold drink freely. This is a sure cure for malerial diseases.

Mutton broth or mutton cooked nicely any way will often cure internal ulcers or summer complaint of long standing. Mutton has greater healing powers than any other meat.

3d. Consumption generally is the cause of a cough that fatigues the system, bringing on bronchitis then consumption. Wister's Cough Lozenges have never failed me in stopping the cough on at least 50 persons and allow nature to do the cure when Wister's genuine cough lozenges are used. L. F. MOULTON.

CRAMPS.—When one is suffering from nervous debility, and much wearied from over-exertion, the muscles are apt to make spasmodic contractions. The arms, hands, fingers and legs are drawn up without volition, and held as by an iron grasp. This condition of the limbs is commonly called "cramp." It is likely to come on while bathing in cold water, or when exposed suddenly to a low temperature. If the cramp is local, affecting only one limb at a time, make an effort to extend the leg or part affected, thus stretching the muscles under the spasm. At the same time apply warm water, if accessible, and rub vigorously with the hands. If the cramps are general, affecting all the limbs, put the person afflicted into a hot bath as soon as possible. If such a thing is not to be had, apply hot water to one limb at a time, keeping the rest of the body wrapped in blankets or extra clothing. Rub vigorously with the hands where the affected parts are accessible, and get the patient into a warm bed at the earliest convenience. An effectual method for preventing cramp in the calves of the legs, which is so exceedingly painful, is to stretch out the *heel* of the leg as far as possible, at the same time drawing up the toes toward the body. This will frequently stop a fit of the cramp after it has commenced, and any one will, after a little practice, be able generally to prevent the fit coming on, though its approach be between sleeping and waking. Persons subject to this complaint should have a board fixed at the bottom of the bed, against which the foot should be pressed when the pain commences.

Beware How You Drink.

What many people, especially children, call thirst is merely a sense of dryness in the mouth and throat. This uncomfortable sensation is caused by the general habit of breathing through the mouth. The air taken into the lungs dries the mouth, tongue and the upper portion of the throat. To drink for the purpose of relieving a mouth made dry by being open, is frequently to overload the stomach with fluids which are not needed, and which, consequently, are detrimental to digestion. It is peculiarly injurious also, for it washes into the stomach all the foul solids which, in the form of dust, find their way into the mouth and throat.

Persons who are compelled to cool and moisten their palates should first rinse the mouth with a sip or two of water. If, afterward, they feel that they must drink they should imbibe by single sips. By this method they will be as fully satisfied with a gill of water as with a pint hastily swallowed.

Ice water is the great American vice, and probably kills more persons than rum. That it is cooling to the entire system cannot be denied, but sudden changes of physical temperature from warmth to coolness are always detrimental to health.

Actual thirst is as quickly satisfied with hot water as with cold. When only ice water is desired the probability is that the person drinking it has eaten something which has irritated the stomach.

The rage for salt, pepper and mustard may be charged with much of the inordinate thirst which makes the traveling American a marvel to his European cousins. Water, to which has been added one-twentieth part of its weight in ice is cold enough for any properly fed person.

Coffee is not a good summer drink. Its stimulating property is beneficial to persons with a sense of physical debility; but coffee arrests, temporarily, all natural processes of waste, whereas in hot weather these should be allowed full play. Tea is a far better drink. It is stimulating, and is therefore very injurious when taken in large quantities; but overstimulation, with its implied necessity of in some way making good the physical force which it enables to develop too rapidly, are its only bad effects. Taken without sugar it is cooling, but a heaped teaspoonful of sugar will generate as much physical heat as a quarter of a pound of beefsteak. Sugar is the most heating of all articles of human consumption.

WORK IN HOT PLACES.—The limit of temperature at which men can work depends upon the length of their exposure, the amount of exertion they put forth, their condition and the nature of the atmosphere, particularly as to its degree of moisture. Men have been employed on railways at 104 degrees, in mines—under very favorable conditions—at 125 degrees, and are said to work occasionally in the stoke-holes of tropical steamers at 156 degrees. Professor Du Bois Raymond has estimated that a temperature of 122 degrees can be endured when the air is as dry as possible, but that even 104 degrees is likely to be fatal in an atmosphere saturated with moisture. It is considered certain that men cannot become accustomed to stand, for any considerable time, a higher temperature than from 140 to 165 degrees, even when they keep perfectly still and airs in quite pure air.

CANNED FOOD.—It is a singular fact that we are indebted to Pompeii for the great industry of canning fruit. Years ago when the excavations were just beginning, a party of Cincinnatians found in what had been the pantry of a house many jars of preserved figs. One was opened, and they were found to be fresh and good. Investigation showed that the figs had been put into the jars in a heated state, an aperture left for the steam to escape, and then sealed with wax. The hint was taken, and the next year canning was introduced in the United States, the process being identical with that in vogue in Pompeii 20 centuries ago. The old ladies in America who can tomatoes and peaches do not realize that they are indebted for this art to a people who were literally in ashes but a few years after Christ. There is nothing new under the sun. Canned tomatoes and loaded dice—the people of Pompeii had both.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

MEDIAN.—*Ledger*, April 11: This quartz claim, located east of the Keystone at Amador City, continues to give every promise of proving a permanent paying mine. The work in hand is the sinking of the shaft on the ledge. This shaft is now down over 100 feet. At the bottom the ore looks remarkably well, both as regards its gold-bearing character, and general live appearance. Some of the specimens taken out are thickly studded with free gold; indeed, parties who have been conversant with the quartz met with around Amador City for many years, say that the ore samples lately taken from the Median are equal in richness to anything that has been heretofore met with in that camp.

ST. JULIAN.—In sinking a winze at this claim another body of rich black metal was struck the latter part of last week. Samples of the ore have been exhibited in Jackson during the week. One of them has a spike of free gold a quarter of an inch thick running through it. It is said that over $1,000 was taken out last Saturday. The strike was made in drifting from the winze at a point 25 or 30 feet below the tunnel level. The seam varies in thickness from two or three inches to a foot. The one-stamp mill has been overhauled and put in good running order. Messrs. J. R. Price, D. D. Mason and Jos. Chatham are working the mine on an agreement that the net profits be divided equally with the owners.

MOORE.—The first installment of the purchase money, amounting to $1,500, was paid early last week. A few men have been put to work cleaning out an old shaft, located on what is called the limestone lead. It is on this lead that prospecting operations will probably be commenced, and the prevailing opinion is that pay ore is more likely to be met with here than at any other point.

VALPARAISO.—This mine, owned by Ginocchio Brothers, adjoins the Mammoth mine on the north. Four men have been at work for some time working two shifts. At a depth of 300 feet a drift is being run south in the hope of striking the rich bonanza vein met with in the Mammoth. A few days ago slate mixed with quartz and freely charged with sulphurets was reached, which is taken as a favorable indication that the ledge is not far off.

MISCELLANEOUS.—A. P. Clough, near Volcano, some time ago picked up a chunk of gold out of his irrigating ditch worth $16. Mr. Reynolds, who is working a gravel claim near Volcano, under lease from A. P. Clough, last week picked up from the bed-rock in the vicinity of the giant, over $100 in coarse gold. The machinery for the 20-stamp mill for the Morgan & Shugert claim in Hunt's gulch has been arriving this week. There are about 100 tons of it altogether.

Inyo.

THE SANTA RITA SOLD.—Inyo Co. *Register*: Phil. Cartier and Peter Foisy have just sold the old Santa Rita mine to John H. Gay. This mine is situated on the mountain west of Mazourka canyon, opposite Independence. Considerable work, with good results, was done on it some years ago, but water coming in, operations were suspended. Though always under location, no work except by the late locators has since been done upon it.

THE MAXIM.—W. A. Stansfield is taking out considerable ore from the Alaska mine at Chrysopolis, and expects to start the Maxim mill in a few days. The ledge at a depth of 36 feet in the Alaska shaft shows about 14 inches of pay ore, which will undoubtedly pay from $40 to $60 per ton. As this ore can be mined and hauled to the mill at a cost not to exceed $4 per ton, it will leave a handsome margin.

FOR A TEST.—W. A. Bolinger last Monday shipped 100 sacks of ore from his mines at Chrysopolis, for the purpose of ascertaining the best mode of them. They are gold sulphurets, and will probably realize from $10 to $20 a sack.

THE BROWN MONSTER.—Messrs. Bell & Thomas are taking galena ore from the Brown Monster mine. During the past month they have taken out eight tons, and will ship a carload in a few days. This ore is quite rich in gold and silver, and leaves a neat margin for profit to the mine owner, besides paying the contractors very well.

THE WHITE STAR.—Messrs. Alexander, Kehoe & Barnes continue to take out galena ores from the White Star, and with a better showing than ever.

THE OLD UNION.—This large silver-lead mine lies four miles south of the Brown Monster. Reynolds & Treglown have been shipping ore from it for months. The ores from all these mines go to San Francisco since the wanton destruction of the Elna furnace, entailing extra expenses.

INDIANA MINE.—This is a rich silver lead near Swansea. Thorpe & Jenkins have been working it on lease for months, and now have ready for shipment a fine lot of ore worth from $600 to $1,000 per ton. A previous lot (over a ton) from the same mine netted over $3,000 per ton.

FURNACES.—Gorman & McKenzie will fire up the Defiance at Darwin in a day or two, on ore from the Lucky Jim mine principally. Fitzgerald will have the Modoc at Lookout, in blast about the 12th of this month, and for a long run.

SILVA'S FIND.—Frank Silva's recent find at Darwin is said to be one of the finest silver ledges in the county. As stripped to hnd the course, it shows about three feet of 100-ounce ore, with scarce a break for 120 feet, as far as stripped at that time.

COTTONWOOD.—The Greenly 5-stamp mill on Cottonwood creek, Deep Spring district, will start up May 1st, on ores from the "78" mine. This lot is from below all former workings, and is said to prospect in free gold far better than any yet extracted from that mine.

THE REWARD.—This is the name of Messrs. Coates & Freeman's recent and notable find. It is generally spoken of as the "Ward" mine, which is not the name at all. The mine is situated about eight miles westerly from this town, and about half a mile south from the stream of the same name (Bishop creek). The two owners are driving ahead continuously, finding spots of fine ore all through the vein matter, which is about six feet thick.

THE BROCKMAN—Six miles west of the Reward Mr. M. C. Brockman is working away on an eight-foot ledge of low-grade gold ore. Several assays, besides many horn prospects, give him high hopes of a $10 working average.

Kern.

KRAMER.—Cor. Calico *Print*: A shipment of ore to San Francisco was made by Mr. Garrison from his mine, the Silver Age. Mr. J. L. Coffman, of the firm of Coffman & Maxey, is at present inside endeavoring to secure additional milling facilities, as their one-stamp mill now running day and night is found inadequate to reduce the output of ore. It consists of a six-inch mortar, 3-pound stamp with gas pipe extension, and muscular motive power.

Mono.

CON. PACIFIC.—Bodie *Free Press*, April 12th: Since last report they have been running in vein northwest from drift No. 1. They have made seven feet, and are able to note a decided improvement since last report. In face of drift they have a fine vein of eight inches. Had no assays during the past week, as there has been no perceptible change in the quality of the ore from report given last week. Will continue driving for No. 2 vein as fast as possible, where they confidently expect a larger and even better vein than they have in the face at present. Have been troubled somewhat with bad air in the cross-cut, but hope soon to overcome that trouble and be able to report a good vein cut in Pacific No. 2.

STANDARD CON.—During the week ending April 11th men were employed as follows: 20 miners, 2 carmen, 1 station tender, 2 shaftmen and 1 fireman at $4; 2 laborers at $3.50 and 1 engineer, 1 carpenter, 1 blacksmitb, 1 punipman, 1 shift boss at $5 per day, and 1 foreman at $200 per month.

BODIE CON.—During the past week 168 tons of ore were crushed at the mill. The bullion from this will be shipped together with the product of last week's run by to-morrow's express. They have stopped hauling ore to the mill, finding the grade too low to work at a profit. They have commenced prospecting in the mine with a full force of men. Thirty-nine men are employed.

MONO.—The Mono south drift has been extended during the past week 15 feet. Its total length from the Bodie line is now 281 feet. The winze has been sunk 10 feet; its total depth being 55 feet. Six miners employed.

Nevada.

PLANET MINE.—Grass Valley *Union*, April 11: Work has been resumed on the Planet gravel mine, on the divide between Steep Hollow and Bear river. The recent purchases of the Dewey claim by the Planet Company gives the latter the ownership of all the ground between the two streams, and about one and a half miles along the divide through which the gravel channel runs. The combined property is tunneled on each side of the divide—the one on the Bear river side having been driven to the pay channel several years ago, but the tunnel being too high the ground could not be worked to advantage on account of the difficulty of handling the water. The tunnel driven in the Dewey claim on the Steep Hollow side is lower than the bottom of the gravel lead, and this is now to be extended to a connection with the Planet drift and will drain off all the water. The distance to be driven is 800 feet, all through gravel, and rapid progress can be made. It is expected that fair pay will be reached before connecting with the bottom of the Planet drift, where rich prospects of coarse gold were obtained when a suspension of work was compelled when the last operations were carried on.

NOTES.—Grass Valley *Union*, April 11: The ledge in tbe Prescott Hill tunnel, Osborn Hill, in the old Wheal Betscy ground, is not showing very large at the time, but it is of good quality. There has been a report that the tunnel running from the level of Wolf Creek into the Lawrey & Long quartz claim, on Winchester Hill was to be extended into the Empire ground, Ophir Hill. There have been surveys made, but the distance is too far and the probable cost too great to make the undertaking practicable. Since work was resumed at the Pennsylvania the shaft has been pumped out, and everything is now in working order. The drifts on the 175 level are to be extended for the purpose of opening up more backs, and a new level is to be opened at the depth of 240 ft., the shaft being down to that depth. Good pay rock is in sight on the 175 level, and it only requires the extension of the drifts to open out fine bodies of ore.

Placer.

OUR DRIFT MINES.—Placer *Argus*, April 11th: Drift mining in that portion of Placer county lying between the North and Middle Forks of the American river, is from all accounts in a fairly prosperous condition. The late purchasers of the Succor Flat mine are getting that property in shape for extensive operations; recent developments in the Mayflower near Forest Hill, we learn are very encouraging; the old Mountain Gate mine at Damascus is keeping up its reputation as a big bullion producer; the Bob Lewis mine at the same place holds its own; the Hogs Back and the Greek claim, further up the divide, have encouraging prospects ahead; Breeze & Wheeler's mine at Bath is always good; and the famous Hidden Treasure at Sunny South maintains its fame by its operations, constant improvements and unfailing dividends. With these mines in operation, and others equally good, perhaps, but as yet less developed, and our greater or less quartz interests, it cannot be said that Placer's mining interests are entirely played out, not by any means, nor that the slickens agitators have entirely succeeded in killing the county, though they tried ever so hard to do so.

San Bernardino.

THE BONANZA KING CO.—*Print*, April 12th: This company has now a force of 40 men that hoists about 12 to 16 tons of ore a day from winzes and drifts, there being no stoping done on the ore bodies. It is not likely they will start up the mill until they have about one thousand tons of ore on the dumps. The Kerr, Belle McGilroy and Mozart groups of mines are all being worked by small forces of men and have a good showing of mineral.

MESKAL DISTRICT.—This district is situated about 35 miles north of Providence. The owners, Wm. A. McFarlane and S. A. Barrett, have been working some men on their "Cambria" mine for some time past. There is a very large showing of mineral being opened up. They have run on the ledge some 80 feet with mineral all the way, and have lately cross cut the vein which shows 5 feet of good mineral.

CALICO DISTRICT.—*Print*, April 12: Jas. B. McGowan is chloriding on the Relie Key and is doing well. Some parties are chloriding on the St. George, adjoining the Occidental on the north. Work has recently been commenced on the Hyena, and the prospects of the mine at present are very good. Reeves Unsworth and his partner are chloriding on the Bullion, one of J. S. Doe's mines, adjoining the Occidental on the north.

OCCIDENTAL.—Operations on the Occidental are progressing smoothly and most satisfactorily under the management of Nels Wager, the foreman. There are 34 men employed and the force will be increased as fast as developments progress. The south-end tunnel is in 225 feet, but no work is being done in it at present. The principal work in this end of the mine is being done on the level above this tunnel and a connection will be made between the two levels by a winze. The upper tunnel is in about 50 feet and terminates at present in a large cavity formed by excavating for ore, which is about 45 feet long, 15 or 20 feet high, and about 25 feet wide, and from which about 300 tons of ore have been taken that average about $100 to the ton. Ore is seen on all sides of this cavity, particularly on the east side and south end, and shows that the body of ore dips into the hill. The width of the strata of ore at this point has not yet been determined, cross-cutting from the cavity eastward having been commenced only a few days ago. It is a beautiful and interesting sight to see the network of blue colored ore, that constitutes a considerable portion of the walls of this cavity, which is rich with black metal and chlorides. Following the car track for 1,200 feet on the west side of the hill we come to the north-end tunnel, which is in about 200 feet, and runs in an easterly direction. Further on and higher up is a tunnel that is in about 150 feet. But little ore of any consequence was struck in this tunnel until it had been driven in about 100 feet, when it took a southerly course and followed a well-defined wall, ore becoming more frequent and of a higher grade, until now the end of the tunnel has the appearance of entering a large body of ore. This tunnel is connected with a shaft and drifts above by means of an ore chute, the ore being lowered to the tunnel and taken out by hand-cars. Considerable ore has been taken from the drifts diverging from the shaft, the most of which yields $250 to the ton. The ore breaks up very easily, and the screenings are very rich with yellow chlorides. The showing at this end of the mine is splendid. From 8 to 12 tons of ore per day are taken from this mine. It is the intention that Barber's mill shall be supplied with 20 tons of ore per day from the Occidental and Garfield mines, and judging from the present developments of these fine properties twice that amount could be extracted every day if desired.

Shasta.

GOLD AND SILVER.—Shasta *Democrat*, April 8th: Dale & Fife have ten tons of ore from the Silver King at the depot sacked and ready to be shipped below to be milled. The McDonald new shaft is now down 55 feet. At 40 feet excellent rock was struck, averaging as well as that found in the old workings. N. J. Pehrson is now running three shafts on the Monarch on Oregon gulch. When the shift is down fifty feet he intends to drift. The Silver King men now have about seven tons of rich ore in sacks at the depot to be shipped to San Francisco. They are now running drifts and stoping out. We learn that a gentleman from Los Angeles has lately found some very fine lead and silver ore on Cow creek, in the vicinity of the After-thought mine. Some rich carbonates were found also. Monday last two tons of ore were taken out of the Silver King which is the richest rock we ever saw. Native silver could be seen in streaks and big chispas in every chunk of ore in the lot. The new 10-stamp mill of the Niagara Mill and Mining Company started up last Wednesday morning on rock from the Shafter mine. The mill works like a clock, and is a model of neatness and efficiency. At the bottom of a fifteen-foot shaft on the Hendricks mine on Alney creek, ore was struck that assays 25 ounces in silver. At this depth further sinking was deferred for the present on account of water. We learn that Whitton & Small, who discovered a rich claim on Squaw creek about six weeks ago, are at work building a horse arastra. We are told that last week they pounded out in a mortar in one day $14.50. Fred Simonds, Sr., returned to town Monday from a three weeks' prospecting trip on Squaw creek. Fred made two locations and from the way they prospect he thinks he has struck a good thing. About a ton of iron ore from the iron mines on Pit river near the U. S. Fishery was brought down last week and left at the depot to be shipped below for a working test. This indicates that the company who bought this property of Potter about a year ago contemplates doing something toward developing it. Robert Campbell, Sid McCoy and Johnny McCall, who are sinking a shaft on a gold lead (located last fall by Lowrey & Brincard) for a half-interest, have the shaft down now about 30 feet. The vein is about fifteen inches wide between contact walls of porphyry and slate. The rock is rich in free gold and they get ten cents to the pan from the loose vein matter. This is certainly a very encouraging prospect. Last week we met Mr. Catton, secretary of the Winthrop mining company of Copper City, and from him learned that the new mill was completed some days and all the machinery in perfect running order. The furnaces will be completed in about two weeks, when the company will commence milling. Every one is watching with intense interest the progress of this mining enterprise, and if the prayers of the people will avail anything the company will succeed in working the refractory ore of Copper City. The success of the Winthrop company will rapidly build up one of the most important and lively mining camps on the Pacific Coast.

Sierra.

PROSPECT.—*Mt. Messenger*, April 11th: A fine prospect has been obtained in the quartz ledge at the head of Coyotcville ravine. This is the ledge that James Cole put up a mill upon many years ago. The present prospecting is being done somewhat higher up the mountain, where the ledge crops out strongly. The chances for a paying ledge are first rate. William Butler has started a tunnel on the hill north of town, to prospect the quartz ledge that crops out on the point above Garibaldi's ranch. One shift is at work in the York ledge pushing the tunnel ahead to the second chute.

Siskiyou.

PICK AND PAN.—Yreka *Union*, April 9: At the McConnell claim on the Klamath river they have been running one derrick for about ten days, and the other one will be in operation in less than one week. There is at present every indication of a prosperous season's run. At the Centennial mine they have been running about a week, and good prospects are being obtained. The owners of the Kanaka claim are busily engaged in getting out timber and otherwise preparing to commence operations soon. The Empire Bar Company are nearly ready to commence sinking, and will soon be in full blast. At the China claim a bee-like swarm of Celestials are busily engaged in making preparations to commence the season's work. At the Portuguese claim preparations are also being vigorously pushed, and active work will soon be commenced. Below the mouth of Scott river Kettlewood & Co. will go into their old claim, and in consequence of the low stage of water and their dams not being carried away this season, they will soon be under full headway. Mr. Mapleson will also operate the same claim which he worked last year, and is nearly ready to commence operations. Messrs. Andrews & Hicks have formed a company, and we are informed will commence operations soon.

SALMON ITEMS.—At the Gold Hill mine, owned by Noonan & Co., and operated by a self-shooter, although water has been very slack during the season, the owners have made a profitable run. Messrs. Hutchinson, Chase & Monahan are starting a new drift in their claim. Messrs. Bevens & Girard, on account of the scarcity of water, have not been able to do much this season. Rundell, Barry & James are ground-sluicing, and it will be two months or more before they will commence bottoming up. Hickey, owing to the scarcity of water, has not been able to run over a week during the season. Ahlgren & Larsen, at the Russian Hill, have done well this season, and are at present engaged in digging a ditch from the North Fork of Salmon. Brookhouse and Ork recently went down the river with a pack-train loaded with provisions, tools, etc., to locate a claim on the Salmon, and expect to commence extensive operations soon. Marshall & Roff have gone down to locate on Austrian Bar. On Eddy's gulch, owing to the scarcity of water, not much mining has been done this season. Frank Manana & Co. have gone up the river to open up White's Bar. The Harris Bros., just opposite White's Bar, propose bringing water on from the river. They have good prospects.

Tuolumne.

POCKET.—Tuolumne *Independent*, April 11: Another big strike was made on Wednesday, in the rich pocket mines on Bald Mountain, opposite Brown's Flat. On that day Wm. Lewis, in the Sugarman mine, came upon a large gold deposit, and took out ten pounds.

NEVADA.

Washoe District.

HALE AND NORCROSS.—Virginia *Enterprise*, April 11th: On the 2,900 level the face of the main lateral drift north, toward the Savage line, has been turned to the left, so as to make a diagonal cross-cut in a north-westerly direction across the ore vein. This cross-drift is expected to be cutting into the ore this morning, about 40 feet north of cross-cut No. 3, and will be driven into the true merits of the vein as diligently as the situation will admit of. This is the all-important point of development for the immediate future on this level. On the 3,000 level cross-cut No. 1, near the Chollar line, is being pushed westward, and has a few feet further to go in order to cut the ore vein. As before stated, it is the intention to advance all three cross-cuts on this level simultaneously into the ore vein, all being in close proximity to its east side or boundary, and all being now about in readiness, with the expected mining magnates immediately interested to arrive this day, very interesting and exciting developments may be expected to be made forthwith.

CON. CALIFORNIA AND VIRGINIA.—On the 1,750 level the drift being run in a south-westerly direction from the main west drift, toward the old Con. Virginia ground, is progressing at the rate of about 60 feet a week. About 70 tons of ore per day are being taken from this level on company account, assaying a little over $20 per ton. The Morgan mill is again running full blast on this ore. The ground above, between the 1,550 and 1,200 levels, worked under the Jones' lease, is yielding about 60 tons per day, assaying $33 per ton. The Eureka mill is kept steadily running on this ore.

BELCHER.—The usual amount of low-grade ore is still coming from the old workings through the Crown Point. The machinery of the Belcher and Crown Point air shaft is being overhauled and put in working order, with a view to utilizing the same in repairing the shaft and working the mine to a greater depth than is done at present. Owing to this shaft being caved at some points the air circulation is impeded.

CHOLLAR.—On the 3,000 level work is suspended in west cross-cut No. 2, which is about 100 ft. south of the Hale and Norcross, and work concentrated into cross-cut No. 1, which commenced a few feet south of the line, but, running a little diagonally to the northward, it is about cutting the Hale and Norcross ore vein, at the line, where it evidently extends into the Chollar.

ALTA.—Explorations from the upraise above the 950 level are progressing as usual, with plenty of low-grade ore in sight. Occasionally a bunch of ore that will pay for milling is met with. This is saved, and quite a number of tons have accumulated which will be milled by and by.

BULLION.—The parties engaged in prospecting for pay ore in the upper levels are putting up a whim over the old Fairview shaft, which they propose cleaning out and utilizing to whatever depth they may consider eligible for a base of operations in going after the ore.

SIERRA NEVADA.—The new surface works are running all right. The repairs required to the shaft

were found to be more extensive than were expected, but the merits of the 520 level will now be investigated as soon as the station is completed and lateral drifts north and south run, from which to cross-cut west. Cedar Hill is simply a mass of low-grade ore at that point, with streaks of high-grade gold as well as silver ore running through it.

YELLOW JACKET.—About 200 men are steadily employed and the daily output of low-grade ore from the old upper workings—from the 1,150 level up to the surface—is very heavy. Between 500 and 600 tons of ore ore are taken daily from this mine, the Crown Point and the Belcher.

GOULD AND CURRY.—The main lateral drift south toward the Savage line is making about 50 ft. a week. Material, hard porphyry, with occasional streaks of quartz and clay.

OVERMAN.—Good progress is being made sinking the winze below the Lambert tunnel to connect with the old Petaluma-street tunnel, or 220 level of the Overman mine. Considerable quantities of fair-grade ore have been taken from this point in times past, and it is known that considerable more remains for extraction.

KENTUCK.—The extraction and milling of the ore from the old upper workings goes steadily along as usual with no important changes to record.

CROWN POINT.—From the 1,700 level upward good streaks and bunches of ore continue to be found, being merely the lower grade leavings of the old bonanza workings and more prosperous days.

BEST AND BELCHER.—On the 1,000 level in the main lateral drift north is steadily being pushed ahead at the rate of 60 ft. a week.

WOODVILLE.—The 300 and 400 levels continue their good yield of pay ore, which is being gleaned by leasers or tributers.

Cottonwood District.

NICKEL.—*Silver State*, April 11: E. C. Asher, of Lovelock, reports the Cottonwood mines as being in a very prosperous condition. George Lovelock the owner of the principal nickel mines in the district, has leased the property to Keyes & Hirsch, who have some 10 or 12 men at work. N. P. Davis, who has a contract for hauling the ore from the mines, which are about 40 miles from the station, has a six-horse team steadily engaged in the business. The mining force will be increased to 25 or 30 men shortly, as the lessees intend to ship a carload of ore daily. Geo. Lovelock, the owner of the mines, receives $20 per ton for all the ore that is shipped.

Eureka District.

QUIET.—Eureka *Sentinel*, April 4th: The mining situation in Eureka district is quiet. The Eureka Con. continues to look and yield favorably. The several pitches on the different levels are holding out well, and within the past few days another favorable looking body, from which good ore is being extracted, was discovered between the sixth and seventh levels in a section of ground as yet wholly unprospected. The discovery was made by a tributer and is known as the "Bennett pitch." The smaller properties of the district are producing equally as well as they have for several weeks past. Many of these mines are worked only by their owners, and for that reason the output is small, but the propositions are nevertheless paying ones to those working, as in many instances the ore is mined within a few feet of the surface and it generally furnaces from $30 to $300 a ton. During the past week the Lord Byron shipped to the Richmond furnaces for reduction 44½ tons; Dunderberg, 12; Jackson, 17; King Lear, 12; Silver Lick, 5; Dug Out, 5; Geddes & Bertrand, 1; Frazer & Molino, 7; and Bully-boy, 2. The new water-jacket furnace for the Eureka Con. smelting works arrived from San Francisco Thursday, but owing to a delay at the foundry in making the necessary castings for a foundation for the same, it cannot be erected in place for several days, and the probability is it will not be started up before the 20th inst. The building for it has been constructed, as have all other structures in connection with the new works. The pump tank, which is 16 feet long, 4 feet wide and 7½ feet deep, the same being on a level and connected with the lake by a nine-inch pipe, is among the improvements added to the works during the past week. Three pumps are being put in place, and they will be ample for all purposes or for any emergency. The location of the tank and pumps is sufficiently far away from the main building so that they can, in case of fire, be called into service and worked without danger to any one. The Richmond works and mine continue closed down.

Rickard District.

NEW LEDGES.—*Silver State*, April 11: John Gay, just in from Pete Flynn's, reports the discovery of a rich mining district in the Bloody Run mountains, between Flynn's Station and Cane Springs. The mines were discovered by ex-Sheriff Rickard and party, who were out their hunting horses. One of the ledges discovered is said to be four feet wide, and the ore is rich. The formation in which the ledge is situated is said to be black slate and syenite. "Montana" has also arrived from the new mines and brought a sack of ore that is astonishingly rich.

Taylor District.

PRODUCING WELL.—Cor. Eureka *Sentinel*, April 11th: As I predicted some time ago that it would, Taylor is beginning to boom. All her mines are in full blast, and all, or nearly all of them, are turning out high-grade ore and plenty of it. With us the day of "assessment principle" is over, and bullion shipments will be in order for some time to come. The Argus group of mines is looking splendidly, and the company undoubtedly will, at an early day, be more than compensated for the prospecting work they have done. The large bodies of ore the company have thus far uncovered is of a superior quality. Our two mills are hammering away and are turning out bullion at a lively rate. Over 100 men are working in the mines, and millmen, wood-choppers, teamsters and others are busy, and all branches of business are lively. Real estate has doubled within the past month. There is talk of some merchants coming from our neighboring town, Ward, to open business here.

White Pine District.

CLOSED DOWN.—Eureka *Sentinel*, April 11th: All work in the Eberhardt and Aurora tunnel at Hamilton was suspended on Saturday last for an indefinite period. A number of old and trusted employes who had worked for the company for the past twelve or fourteen years were among those discharged.

ARIZONA.

BISBEE.—*Tombstone*, April 11: The output of bullion from the Copper Queen has somewhat decreased. The law suit heretofore pending between the Queen and Prince mines has been decided, but still a suit for damages hangs over the Queen. It is said the Prince claims $300,000. This may account for the late draft of 25 men.

ATLANTA.—Till lately work has been principally confined to the east end of claim, where the main shaft is nearly 400 feet deep, and which cuts through a large body of fair grade ore. Now work has been resumed on the west end, with very favorable results. The present low prices of copper operate greatly against the employment of as many men as those interested in Bisbee could wish.

COPPER PRINCE.—Have nearly completed grading for their smelting site, which is situated in the canyon close to the superintendent's house. A well is being sunk on their ground, and there is every probability that the smelter when erected will be one of the most labor saving institutions of its kind in this country, with the present amount of ore in sight. It is calculated this smelter will be constantly employed for some time to come.

GRAND CENTRAL.—Mr. Gage informs us that the mine is looking as well as usual, and although no further developments have to be noted, the usual quantity of ore is shipped to the mill. As to the pumps the larger portion of the machinery is now on the way. The pumping engine, sinking pump and a portion of the column will be shipped from San Francisco next week, and by the time of their arrival the building to cover them will be ready for their being put in place.

EMERALD.—Is being steadily worked. The ore in this mine is found to be very "lunchy" and much waste has to be hoisted to keep the workings in good order. Regular shipments take place to the Grand Central mill.

STATE OF MAINE.—Pending the absence of Mr. C. W. Leach, this mine has been temporarily closed down. This puts about 25 men out of employment.

BIG COMET.—Owned by D. McCarty and Nellie Cashman, has been steadily shipping ore for some time past. In the course of a few days about 15 to 18 tons will be shipped every two days to the smelter at Charleston. The ore contains a good deal of manganese and is found to work well with the various qualities worked there.

NO COUNT.—Wm. Harwood is working away at this prospect and getting out ore. The grade, however, is not high.

SUNSET.—Captain Taylor who obtained a lease on this property has sublet his lease to some chloriders who are doing well. This is one of the oldest locations in the camp, noted in days gone by for the richness of the ore found, and as is so often the case in this camp, the ore lies near the surface.

MAMIE.—This is another of those properties being worked under a chloriding lease. Rich strikes of good ore are continually met with, but they are for the most part narrow. Thousands of dollars worth have been taken out of this property, and the present lessees are doing well.

JUNIETTA.—General Tuttle works along with his force and has quite a large number of sacks of ore stacked up. Steady work progresses and the result of steady work is known best to those interested.

EMPIRE.—It is reported that the company have $300,000 in the treasury ready to resume operations as soon as the question as to draining the bonanza mine has been settled. At present nothing is being done and the superintendent, Mr. Cutler, is now in Florida.

STONEWALL.—According to instructions from headquarters, this mine has for the present been shut down. It is uncertain for how long.

ALPS.—George Rutledge is still working away to find the body of ore he believes to be hid in the hill. A large amount of work has been done on this property, but hitherto without any permanent developments being met with.

CONTENTION.—A few men are now employed cleaning out the shaft and other workings, preparatory to starting up simultaneously with the Grand Central, when the pumps are ready.

HARO UP.—Some assaying has been lately commenced here. This is one of the Corbin properties and was located in very early days.

LITTLE DEVIL.—Is being chloriding by Mr. Green and his partner Macdonald. Several rich veins have been found on this property, and at one time it was thought to be a veritable bonanza. It may prove so yet.

LESLIE.—Has been steadily worked for the last eight months by those energetic miners, Robinson and his partner. The result encourages them to proceed, and in the event of their making a success many prospects in their neighborhood will be set to work.

CONTACT.—This mine is now owned entirely by C. W. Leach, who has had some men constantly at work for months back. This was the mine backed by George Hearst and surrendered by him after the completion of a good deal of work. The present owner is, however, working on a different part of the claim.

COLORADO.

SILVER PLUME.—Colorado *Miner*, Feb. 11: Calvin Anderson & Co. lessees on the Atlantic mines on Brown Mountain, have a fine streak of high-grade ore. Their last mill-run returned for first-class 900 ounces, and for second-class 350 ounces silver to the ton. A shipment of ore was made last Friday from the Kilbride lode, on Brown Mountain, the returns of which we failed to glean. Dr. Robinson of Kentucky, owner of the Hardscrabble group of lodes, on Hanna Mountain, writes that he intends to start up work this spring on his properties. Work has been commenced again on the Pickwick lode, on Saxon Mountain.

IDAHO.

CLIMAX.—Wood River *Times*, April 8th: Herman Schaub, who has charge of the work in the Climax mine, opposite Lamb's ranch, about one mile west of Hailey's, was in town to-day with samples of ore for assay. He stated that he and another man had been working there since last August for Capt. Guyer, owner of the property, for wages. They shipped two carloads of ore last fall, which netted $3,500, but have never stoped any, all the ore sold having been extracted in doing development work. The tunnel is now in about 210 feet, and for over 150 feet of that length there is ore. The tunnel runs under the ledge, but small raises have been made at various points, to ascertain the width and quality of ore. The width has been found to vary from 6 to 24 inches of solid galena which assays over $100, and the ore improves in grade as the tunnel penetrates into the hill. As above stated the tunnel runs under the ledge, leaving the ore in place, as Captain Guyer's intention is to open up the mine, and not to realize on his ore beyond what is sufficient to pay the running expenses. But even now, if desired, several tons could be extracted per day.

THE COPPER KING GROUP.—Work on the long tunnel in the Big Copper mine, of the Copper King group, out Lost river way, has progressed all winter, and the header is now in over 300 feet. It has cut several stringers of good ore, one of which is over 3 feet in width. Recently, in cutting through a stratum of black oxide of copper, some native silver was found. All this proves the property to be enormously valuable, and as the owners propose to work it vigorously a few months more will doubtless suffice to show that the surface prospects were no blow-out, but genuine out croppings. Recent advices from G. L. Center, superintendent of the smelting furnaces operated in connection with the Copper King mines, state that he will return soon for a summer campaign. He is expected by the 1st of May.

THE HORN SILVER.—Frank Martin, sole owner of the famous Horn Silver mine, in Champagne district, arrived to-day from Salt Lake, where he has been for some weeks, making arrangements for the sale of his ore. Mr. Martin is an experienced miner, who deprecates the existing excitement and rush to the district. When he left the Horn Silver was only "prospect" (as he calls it), which shipped ore; but other discoveries may have been made since. As to his property Mr. Martin says that he does not yet know either its extent or value. In the shaft he has 2½ feet of 630-ounce ore, while the entire hillside upon which the Horn Silver is located seems to be milling ore. At any rate, there seems to be a width of 60 to 70 feet of that class of ore. W. H. Walker, who has charge of operations at the mine, is on the way with another load of ore for Salt Lake. When he returns the force at work will be increased, but Mr. Martin does not know how many men he will be able to work to advantage.

THE TRIUMPH GROUP.—The Triumph, Minerva and May Leaf claims, on the East Fork of the Wood river, have just been incorporated and sold to a joint-stock company, organized under the laws of Utah, with headquarters in Salt Lake City. The claims constitute what was known as the Triumph group, and owned by Domski & Hillebrandt. These men discovered them three years ago, and began opening them, taking out some $4,500 worth of ore. In doing this, however, they became involved in a few thousand dollars, and their mining bark stranded in the sea of litigation, until the debts and accruing costs amounted to about $8,000, Pinkham & Lewis, of Ketchum, paid off the claims, thus acquiring title to the property, and then interested Swift & Conklin with themselves.

THE NEW "LAVA" CREEK DISTRICT.—Three or four prospectors got in from "Lava" creek to-day, to record some locations. The new district is on Champagne creek, and is to be known as Champagne district. There is quite a rush to the new camp, over 100 persons being there already. The ledges have massive outcroppings, and are easily got at. The Martin mine has more ore in sight than the Minnie Moore and Queen of the Hills together. The Rattlesnake mine, adjoining is just as good. So is the Extension; also, the Last Chance. Some of the ore brought in by the prospectors carries an almost incredible percentage of horn silver, which can be cut with a knife. One chunk of five pounds shown the *Times* reporter must go all of $10,000 per ton, or $5 per pound.

MONTANA.

PHILIPSBURG MINES.—*Inter-Mountain*, April 8: Excellent reports are received from the Granite Mountain, good ore being abundant in all the workings. The mill is in smooth and successful operation, and Capt. Plummer, the new superintendent, is sanguine over the appearance of the mine. The bullion shipments are between $65,000 and $70,000 monthly. The Hope is in good shape. The annual report of Supt. Babcock, who is now in Butte, shows that there is enough ore in sight to last six months. The diamond drill has been used successfuly in searching for ore bodies. A total of 5,313 ft. of holes were bored, at an average cost per foot of $1.11½, and an average bored per hour of 6.36 ft. During the fiscal year ended September 30, 1884, 2,822 tons of ore were mined, at an average cost of $12.91 per ton; 3,136 tons, including custom ores, were milled and amalgamated, at an average cost of $6.35 per ton; average amount recovered, 16¾ ounces per ton of ore amalgamated; 2,573 ft. of levels, drifts, shafts, etc., were run, at an average cost of $15.69 per linear ft., and about 25 cents per cubic ft. The cost per ton of ore and waste removed is stated to have been about $3. Batteries in service 156 days; average ore crushed per stamp in 24 hours 2.24 tons; average capacity of pans per charge, 2,267 tons. Hope ores crushed, 2,840 dry tons; average assay value, 21.33 ounces per ton; estimated per cent of reduction, .75. Custom ores milled, 296 dry tons, assay value, 30.57 ounces per ton.

NEW MEXICO.

ORE.—Silver City *Enterprise*, April 10: A rich strike of chloride ore has been made in the Burro mine, at Fleming. A shipment of ore will be made from the New York mine at Lone mountain Monday. McCone & Keister of Gold Hill shipped 21 sacks of ore from the Maud S. mine last week. A carload of ore was shipped yesterday from the Rose mine. It did not contain much of the native silver or high-grade ore of the mine. An extensive strike is reported to have been made upon the Augusta mine at Fleming this week. The ore is being sacked for shipment. There is a fair prospect now that there will soon be a 10-stamp mill put in Gold Hill, as there are parties now in the East making the necessary arrangements. C. E. Conway recently sold a one-third interest in the Novelty claim at Malone to H. L. Pickett for $1,000 cash. The Novelty is a good claim. It lies between the Young man mine and the Walpies. The Flagler reduction works of which Col. H. H. Carpenter is manager, will commence operations within two weeks' time. The improvements to the old plan have been very extensive and complete. The Flagler reduction works will do for Silver City what the Billing works did for Socorro. A cross-cut has been run on the New York mine, at Lone Mountain, since it was purchased by Montgomery & Mitchell, that shows up a 22-foot body of excellent ore. It is said a mill will shortly be placed upon the ground and many miners put to work on the property. There have been several other large ore bodies uncovered in other claims in this camp by recent development work.

OREGON.

PROSPECTING.—Jacksonville *Times*, April 10th: A great deal of prospecting is now going on. Ingram & Dean of Willow Springs are cleaning up, with fair results. Jack Layton has a good supply of water at his mines on Applegate, and is doing well. Hardman & Chamness of Gold Hill have discovered what they think is a rich vein of ore not many miles from that place. Mr. Bowman, representing San Francisco and Baltimore capitalists, is prospecting the chrome mines in the vicinity of Riddle. J. J. Brown informs us that one Otto, who has been mining some distance below Grant's Pass, has done well this season. He picked up a few neat nuggets. Rube Jones has sold to Mr. Pratt of Myrtle creek one-half of his placer mining claim near Canyonville. J. A. Harvey informs us that the discovery made by M. L. Colvig, was on the left-hand fork of Foots creek, and is thought to be a rich one. The quartz seems to be very rich in silver and assays well.

UTAH.

STAR DISTRICT.—Southern Utah *Times*, April 8: Throughout the district the mines are looking all that could be desired, and considerable ore is being extracted. Take the camp all through and it presents a much livelier aspect than it has done for several years. In early days very little deep sinking was done, much of the ore shipped being surface ore; but at present the camp has undergone a radical change and depth is now the rule with results that have firmly established the camp as an ore producer. That Star District contains high-grade ore is beyond question, though like any other camp it comes in for its share of low-grade. The great difficulty the miner has to contend with here is the enormous and exorbitant charges for freight by the Utah Central Company. Wickizer & Co. have leased the Waukeegan. The vein is looking very favorable and is on the increase. Mr. Campbell is driving ahead with all his mines. He has a large force of men scattered throughout the district, more particularly in North Star. We hear but little of the Campbell works making any progress toward completion. If the owners were as anxious to receive ore as the miners are to ship we should all be happy. J. F. Brown is working an old prospect called the Buckhorn. He has recently struck a fine vein of ore in spar, assaying up in the hundreds. The pay streak, as far as exposed, shows about a foot. O. T. Clark is running a tunnel to tap the Monarch ledge. He expects to cut the vein in about five weeks. Jas. Barrett is working the St. Mary and shipping ore. This mine is an immense deposit of fair-grade ore, which is eagerly sought after by the smelting companies on account of its fluxing properties. Thirteen years' work has been done upon this mine and it is opened out in a sytematic manner. Wm. Martin is the owner of two of the finest prospects in the district—the Talisman and the Stalwart. The Talisman is a large quartz vein, assaying from 300 to 400 ounces in silver with a fair percentage in lead. A shaft is sunk 150 feet in the gulch. The vein is about four feet wide with a foot pay streak. Several other workings on the vein have been made, all showing up well. The Stalwart is a fine piece of property and would command a good figure. The principal working is a shaft down about 250 feet. Considerable drifting has been done on the vein, all proving the ore body permanent. The average run or ore produced will assay in the neighborhood of 400 ounces silver and about 20 per cent lead.

HORN SILVER.—The smelters at Francklyn have been blown out and 14 carloads of bullion, valued at $600,000, moved to market. Last Sunday night the old workings in the Horn Silver mine caved again, with a mighty crash. The cave caught no men, but it closed up the draft in the new workings so that as late as yesterday a match could not be lighted on seven in the new shaft, and several of the underground men were laid off. If the previous caves did not put an effectual kibosh upon the old shaft and works this one has.

REVIEW.—Salt Lake *Tribune*, April 11: There have been some showers during the week, but the apparently long-settled good weather continues. The movement of the metals has also been fair. The shipments out from Salt Lake for the week ending Saturday April 4th, inclusive, were 1,909,964 pounds. The receipts in this city for the week ending April 8th, inclusive, were $113,429.46 in bullion and $14,300 in ore; a total of $127,729.46. The total of the previous week was $85,409.25, of which $72,519.25 was bullion. The shipments of the Ontario for the week were 69 bars, of the value of $49,489.46; total for year, $483,634.23. The Horn Silver has made no reportable shipments since the 1st of January. The amount shipped since will be made known in due time. Silver Reef contributed $12,150 in silver this week to the country's wealth, of which the Christy sent four bars, $5,910, and the Stormont three bars, $5,240. The product of the Hanauer smelting for the week was 22 cars of bullion, $51,790. Ore receipts were $5,100 from the Martin mine, $8,000 from the Queen of the Hills, which seems to have resumed regular shipments after its season of trouble with the Miners' Union; and $1,200 from the Overman.

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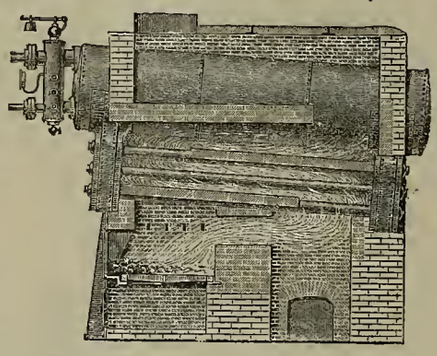

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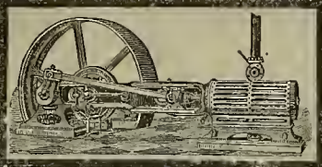

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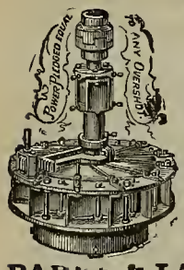

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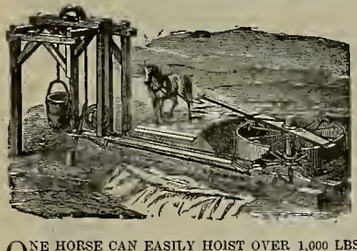

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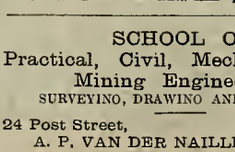

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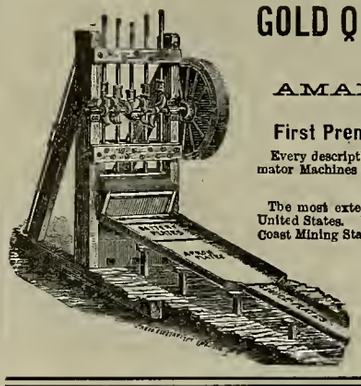

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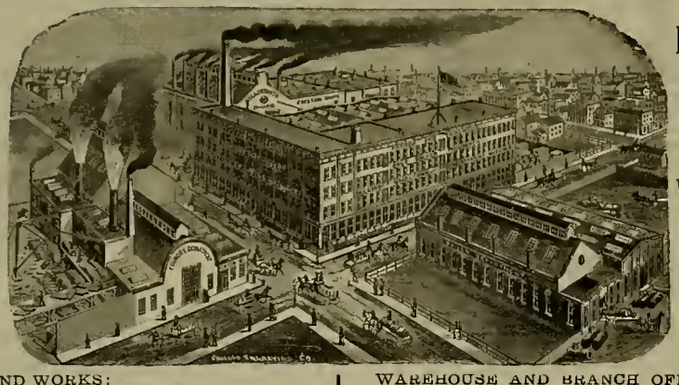

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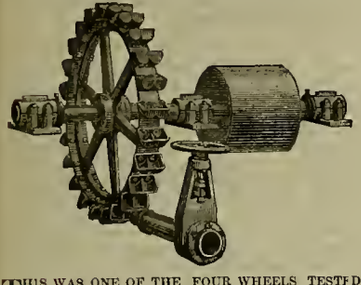

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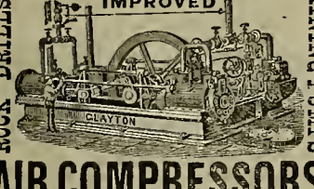

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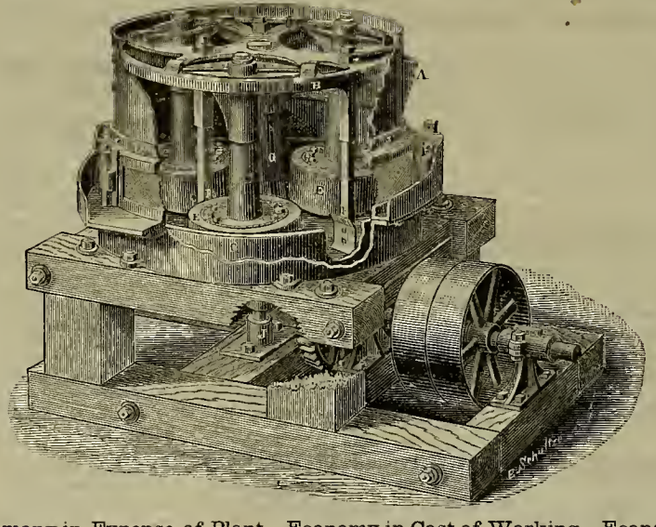

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A Glance Over the Mining Field.

Colorado has taken a step backward and passed a law taxing the net proceeds of the mines, much to the disgust of the mine-owners.

Mining matters in Arizona are rather quiet just now, but the mineral is there and it is only a question of time when the bullion output will be increased.

The northern counties of California are in the midst of a mining boom, and are attracting the attention of miners everywhere. Shasta, Sierra, Siskiyou and Trinity counties will show up many new prospects this season.

New Mexico mining affairs are quiet. More capital is needed in that region to properly develop the properties already found, and there is yet a large area hardly prospected.

Colorado miners are grumbling at the charges for smelting, and there are serious complaints at the management of the concerns at present monopolizing the business. There are smelters enough to handle the product, but the people are not satisfied at the prices made.

Quartz mining around Prescott, Arizona, is beginning to look up again after a period of depression. Six mills will soon be at work. They are: The 5-stamp mill which D. W. Frary is about ready to run in Walker district, 12 miles from Prescott. the Peck, 10 stamps, to be operated hy W. C. Dawes; the Del Pasco, 4 stamps, to be run hy Robbins and Gobin; the Big Bug mill, 10 stamps; the Conger, 10 stamps; and a 10-stamp mill on Turkey creek. Here are 49 stamps that will soon he dropping. A great deal of the ore to he crushed contains more gold than silver. There is, too, a probability that the Groom Creek mill, 10 stamps, will be set at work this summer, and the Prescott Mining Co., Mr. P. A. Craigue, superintendent, will, in about six weeks, have a 10 or 15 stamp mill crushing sterling ore.

The Neihart Camp, Montana, is at present a poor place for a working man to go to, but the outlook of the mines is said to he promising.

Cœur d'Alene, Idaho, has a population of about 3,000 and considerable gold is being taken out. Some $12,000 in nuggets were received a week ago at the U. S. Assay Office, Helena, from these mines.

It is thought that the Richmond Con. Works, at Eureka, Nev., will start up again hy the first of next month.

The low prices of copper are very detrimental to the copper mining intcrests of Montana and Arizona.

As we have stated in the PRESS several times, the miners are paying more attention to gold prospecting than ever before. Many of the Colorado districts are doing well in gold production, and hid fair to increase it. Our exchanges state that not only are the placers to he vigorously worked, but also stamp-mills are being rapidly erected, and an abundance of pay ore for their steady employment is assured. San Miguel county will this season turn out gold hullion second only to Gilpin county. Summit county will greatly increase her gold yield, and certain districts of Gunnison will pound out considerable gold. It is thought that Boulder will he a much larger producer of gold this year than for some years past. The most noticeable progress in this respect, however, is to be found in Lake county, which is given hy the *Herald* as follows: To-morrow morning the Oro mill, with 25 stamps, the First National mill, with 10 stamps, the Seven Thirty mill, with 5 stamps, and the Lilian mill, with 20 stamps, are to commence again beating gold out of ores from the mines of Printer Boy Hill. Sixty stamps running on gold is not a bad showing for a silver and lead district. As Leadville's mineral resources continue developing her gold production increases. Give Lake county's auriferous lode and placer mines an opportunity and the excessive product of the yellow metal will soon hring the intrinsic value of silver up to where it justly helongs.

News has been received at Eagle Pass, Texas, of the discovery of rich gold fields in the Santa Rosa mountains, about 100 miles west from Santa Rosa, Mex. The discovery was made hy the Davis brothers, who were working a profitable silver mine in the same range, but have abandoned their silver mines and located claims in the gold fields. The gold lies in quartz.

THE iron-works at Iron City, Utah, are likely to he removed to Cedar City at an early day. The cause for the removal of the works is that it will be a great saving to the company in the hauling of coal. If this is the case, the company have given up the idea of constructing a railroad from the furnaces to the coal mines.

The ore developments on the lowest levels—2,900 and 3,000—of the Hale, Norcross and Chollar mines, or the Comstock, are so far only first rate prospects, not bonanzas, hy any means. The ore on the 2,900 level is low-grade with some bunches assaying high. The whole mass will, however, pay for milling. The Virginia *Enterprise* cautions people against getting excited on the proposition, saying: "Bear in mind that there is a great wall of hot water a thousand feet high on either side and surrounding this new developmeut—that it is being made over a thousand feet below the surface of the aqueous impediment that so effectually floods and holds arhitrary possession of the lower levels of the Comstock, and that a sudden and unlooked-for inhurst of water tapped hy drift or crosscut can flood the little Hale and Norcross fortress and drown out the forlorn hope in spite of the great hydraulic pump. Meanwhile, this good and very encouraging development has infused new life into the Comstock community, and inspired renewed hopes of a return to former prosperity. It it turns out as well as is anticipated, these renewed hopes will hloom into tangible realities, and old works and new works will be started up again in all directions and all along the line. And most certainly the submerged lower levels will he pumped out, especially at the south nr Gold Hill end, and good prospects already developed before the hot floods hursted in will he again followed up—or down."

It is stated that after May 1st, hy means of the new trail now being made, the trip to New River mines can he made in one day from Weaverville, Trinity county.

AMONG the Lake Superior copper mines the Atlantic makes money with .75 per cent ore; the Franklin harely pays expenses with 1.78 per cent ore; and the Huron runs hehind on ore of 1.80 per cent.

P. A. CHALFANT, who for many years conducted the Inyo *Independent*, has started the *Inyo County Register*, at Bishop Creek, in that county. He makes a good heginning hy giving plenty of local items, including a good summary of mining news of the region thereahout. A local paper can do great good to the miners in its region hy keeping outside people posted on what is going on amoug them, and the publisher of the *Register* is evidently aware of this fact.

DR. ASA GRAY, the distinguished hotanist, is now in San Francisco.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Andes S M Co	Nevada	26	25	Mar 2	Apr 8	Apr 30	B Burris	309 Montgomery st
Alaska M and M Co	Alaska	10	35	Apr 3	May 4	May 20	T J Hay	306 Pine st
Con Amador M Co	California	9	50	Mar 16	Apr 15	May 1	F B Latham	408 California st
Daisy Cement M Co	California	3	2	Mar 28	May 5	May 27	C J Collins	512 Montgomery st
Excelsior W and M Co	California	7	50	Sept 2	Apr 8	Apr 28	W J Stewart	215 Sansome st
Golden Channel M Co	California	2	01	Feb 12	Mar 26	Apr 21	A B Paul	328 Montgomery st
Hale & Norcross M Co	Nevada	84	50	Mar 2	Apr 7	Apr 28	E B Holmes	309 Montgomery st
Horseshoe M Co	California	4	2	Mar 9	Apr 11	Apr 27	A Berg	Grass Valley
Indian Spring Drift M Co	California	5	03	Feb 19	Mar 23	Apr 23	A B Paul	328 Montgomery st
Julia Con M Co	Nevada	23	10	Apr 6	May 13	June 5	J Stedfeldt	412 California st
Mayflower Gravel M Co	California	29	10	Mar 26	May 5	May 29	J Morizio	328 Montgomery st
Mexican M Co	Nevada	29	25	Feb 24	Mar 31	Apr 21	C E Elliott	309 Montg mery st
Noche Buena M Co	Mexico	1	11	Mar 27	May 8	May 23	C Hart	106 Battery st
North Star G M Co	California	1	50	Mar 5	Apr 9	May 1	D A Jennings	401 California st
Pinal Con M Co	Arizona	6	06	Apr 10	May 18	June 8	W Letts Oliver	328 Montgomery st
Puget Sound Iron Co	Wash Ter	11	50	Apr 14	May 25	June 25	A Halsey	328 Montgomery st
Pittsburg M Co	California	19	5	Feb 28	Apr 25	May 15	C J Banonann	210 Front st
Rainbow M Co	California	13	15	Mar 14	Apr 21	May 20	P F Mohrhardt	307 Montgomery st
Sulphur Bank Q M Co	California	3	50	Feb 25	Apr 16	Jun 1	L Hermann	220 Sansome st
Summers Con M Co	California	3	05	Mar 17	Apr 20	May 12	F E Luty	330 Pine st
Tower Con M Co	California	2	10	Mar 11	Apr 15	May 5	G W Sessions	309 Montgomery st
Yosemite M Co	California	2	2½	Feb 7	Mar 16	Apr 21	J Weisheim	Grass Valley

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Marshall M Co	California	A L Perkins	320 Pine st	Annual	May 1

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Kossuth M Co	Nevada	C K Sturtevant	328 Montgomery st	06	Mar 16
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Feb 13
Plymouth Con G M Co		W Van Norden, Pres.	23 Nassau st, N Y	50	Apr 6
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Feb 16

PACIFIC COAST WEATHER FOR THE WEEK.

(Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE. Apr 5-Apr 12	Portland. Rain.	Temp.	Wind.	Weather.	Red Bluff. Rain.	Temp.	Wind.	Weather.	Sacramento. Rain.	Temp.	Wind.	Weather.	S. Francisco. Rain.	Temp.	Wind.	Weather.	Los Angeles. Rain.	Temp.	Wind.	Weather.	San Diego. Rain.	Temp.	Wind.	Weather.
Thursday	.00	64	NW	Cl.	.00	78	NW	Cl.	.00	73	N	Cy.	.51	70	N	Fr	.00	87	W	Fr.	.00	82	W	Fr.
Friday	.00	67	NW	Cl.	.00	76	N	Cy.	.00	70	N E	Cy.	.—	67	E	Cy.	.00	83	W	Cl.	.00	76	NW	Cl.
Saturday	.00	74	S	Cl.	.12	73	S	Fr.	.04	74	S	Fr	.02	64	NW	Cl.	.00	79	S W	Fr.	.00	72	NW	Cl.
Sunday	.80	61	S	Cy.	.00	73	S	Cl.	.00	69	W	Cl.	.09	64	S W	Fr.	.00	74	S E	Cy.	.00	74	S W	Cl.
Monday	.05	60	NW	Fr.	.00	70	S	Fr.	.00	68	W	Cy.	.00	87	S W	Cl.	.02	72	S	Cy.	.00	72	S W	Cl.
Tuesday	.00	60	E	Cy.	.15	70	S	Fr.	.00	67	S W	Cl.	.00	60	E	Cy.	.22	62	E	LR.	.03	69	S W	Cy.
Wednesday	.—	50	S	Cy.	.00	62	S	Cy.	.00	66	S	Cy.	.—	60	W	Cl.	.66	67	S	Cy.	.02	65	W	Cl.
Totals	.83				.27				04				.53				.90				05			

EXPLANATION.—Cl. for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature wind and weather at 12:00 M. (Pacific Standard time), with amount of rainfall in the preceding 24 hours.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Mar. 26.		WEEK ENDING Apr. 2.		WEEK ENDING Apr. 9.		WEEK ENDING Apr. 15.	
Alpha	.60	.65	.75	.80	.25	1.50	1.00	1.50
Alta	.15	.25	.25	.30	.40	.30	.30	.65
Andes	....	.05	....	.05	.35	.40	.40	.50
Argenta	....	....	....	....	....	....	....	....
Belcher	.75	.80	.75	.85	.90	1.10	1.00	1.45
Belding	....	....	....	....	....	....	....	....
Best & Belcher	.90	1.05	1.05	1.15	1.50	1.95	1.90	2.80
Bullion	....	.25	....	.25	.35	.60	.40	1.70
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	....	....	....	....	.15	....	....
Bodie Con	2.10	2.30	1.95	2.20	1.55	1.75	1.40	1.60
Benton	....	.05	.05	.10	....	.15	.10	.15
Bodie Tunnel	....	....	....	.30	....	....	....	.25
Bulwer	.35	.40	.30	.35	.35	.40	.30	.35
California	.35	.40	.40	.45	.65	.95	.90	1.15
Challenge	....	....	....	....	....	.25	.15	.40
Champion	....	....	....	....	....	....	....	....
Chollar	1.65	2.00	2.05	2.15	2.70	3.30	3.15	4.75
Confidence	.75	.80	....	.80	....	....	1.25	1.50
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.35	.40	.40	.45	.65	.95	.90	1.15
Con. Pacific	....	....	....	....	....	.65	....	....
Crown Point	.75	.80	1.00	1.00	1.25	1.10	1.00	.90
Day	....	....	....	....	....	....	....	....
Eureka Con	....	....	3.35	4.00	4.50	4.60	....	4.25
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	....	.25	....	.25	.30	.35	.35	.45
Grand Prize	....	....	....	....	....	....	....	....
Gould & Curry	.70	.80	.85	.85	1.00	1.90	1.90	2.85
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	4.85	6.00	5.50	6.12½	5.63	10.50	6.77	12.00
Holmes	....	....	4.75	4.80	....	4.75	....	4.50
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	....	....	.15	....	.20
Justice	....	....	....	.15	.20	.30	.25	.40
Martin White	....	.65	.60	.65	....	....	.45	.60
Mono	1.20	1.30	1.05	1.15	1.10	1.20	.90	1.10
Mexican	.15	.25	.45	.50	.70	.80	1.00	1.55
Mt. Diablo	....	3.85	....	3.00	3.95	....	....	4.00
Northern Belle	....	....	....	....	....	....	....	....
Navajo	1.10	1.15	1.05	1.10	1.05	1.10	1.00	1.05
North Belle Isle	....	.15	....	....	....	.15	....	....
Occidental	....	.85	....	1.25	2.10	1.60	2.75	
Ophir	.55	.60	.50	.55	.70	.80	.95	1.60
Overman	....	....	.15	.20	.25	.40	.35	.40
Potosi	.75	.90	.90	.95	1.25	1.55	1.30	2.05
Plute	....	....	....	....	....	....	....	....
Savage	1.85	2.20	2.25	2.75	3.15	4.40	3.10	6.25
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	.25	.50	.40	.55	.85	1.00	1.15	2.00
Silver Hill	....	....	....	....	....	.10	....	.10
Silver King	3.25	3.75	....	3.40	....	3.70	2.60	5.00
Scorpion	....	.10	....	.15	.20	.20	.20	.30
Syndicate	.40	.45	....	.40	.45	.50	....	.40
Tioga	....	....	....	....	....	....	....	....
Union Con	.40	.45	.45	.50	.70	.85	.95	1.70
Utah	....	....	....	.70	1.10	1.10	2.05	
Yellow Jacket	1.25	1.35	1.60	1.95	1.80	2.40	1.80	2.35
	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY A. M., Apr. 16.

300	Andes	.50c	50	Hale & Nor.	10.75@11.75
750	Alta	.50@55c	250	Holmes	4.00
530	Alpha	1.50@1.60	950	Mexican	1.25@1.35
320	Bodie Con	1.60	50	Navajo	95c
1120	B. & Belcher	3.10@3.20	100	Occidental	1.30
100	Belcher	3.50	650	Ophir	1.20@1.25
250	Bullion	60c	600	Overman	35c
1000	Benton	15c	950	Potosi	1.65@1.70
1220	Chollar	4.20@4.25	1000	Sierra Nevada	1.50
450	Crown Point	1.35	1895	Savage	5.87@6
1840	Con Va & Cal	1.05@1.50	100	Scorpion	25c
200	Exchequer	40c	380	Union	1.15
1915	Gould & Curry	2.60@2.65	20	Yellow Jacket	2.25@2.30

Bullion Shipments.

Christy, April 7, $5,260; Stormont, 7, $1,950; Queen of the Hills, 7, $2,200; Hanauer, 9, $4,900; 10, $2,800; 11, $2,800; Vienna, 12, $2,000; Hanauer, 12, $5,200. Queen of the Hill, 12, $1,100. The banks of Salt Lake report the receipt for the week ending April 8th, of $113,429.46 in bullion, and $14,300 in ore; a total of $127,729.46.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & CO.'S SCIENTIFIC PRESS PATENT AGENCY, 262 Market St., S. F.

FOR WEEK ENDING APRIL 7, 1885.

315,110.—WHIP-SOCKET, OIL-CAN AND WRENCH—C. L. Bard, San Buenaventura, Cal.

314,999.—HEATER—H. B. Chase, Portland, Or.

315,255.—STOVE GRATE—De Guerre & De Lano, S. F.

315,267.—WATER CARRIER—Jas. F. Fine, Lake, W. T.

315,141.—DRYING APPARATUS—O. B. Hardy, S. F.

315,287.—PIPE COUPLING—J. H. Hobart, Oakland, Cal.

315,143.—WHEAT BREAKER—Hudson & Tobey, Salinas, Cal.

315,152.—BURGLAR ALARM—Ira G. Leek, S. F.

315,044.—PACKAGE COMPRESSOR—Luce, Boole & Byron, S. F.

315,425.—INDUCTION APPARATUS FOR TELEGRAPHY—J. C. Ludwig, S. F.

315,426.—RHEOTROPE OR CURRENT REVERSING KEY—J. C. Ludwig, S. F.

315,427.—POLARIZED TELEGRAPHIC RELAY—J. C. Ludwig, S. F.

315,428.—GENERATION OF INDUCED CURRENTS FOR TELEGRAPHIC PURPOSES—J. C. Ludwig, S. F.

315,325.—CABLE GRIP—J. H. Parkinson, Bodie, Cal.

315,077.—WIRE ROPE OR CABLE—Thos. Seale, S. F.

315,096.—PUDDLING FURNACE—J. Webb, Alameda, Co., Cal.

315,195.—PASTE HOLDER—P. Weiss, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SUPPORT FOR CARRIAGE-TOPS.—Isaac L. Umstead, Ione City, Amador Co., No. 314,631. Dated March 31, 1885. This inventiou relates to the class of carriage-tops which are adapted to be raised and thrown back, and to certain improvements in the means for supporting them. It consists in a peculiar adjustable or extensible rod, one on each side of the top, journaled in its lower end on the arm of the shifting rail and pivoted at its top to the rear how of the carriage top; and it further consists in certain details of construction relating to an eccentric hearing on the lower end of the rod, its various adjustments, means for holding it when necessary and preventing rattling.

COMBINED WHIP-SOCKET, OIL-CAN AND WRENCH.—Cephas L. Bard, San Buenaventura. No. 315,110. Dated April 7, 1885. This is an invention in which the oil-can is secured to the hase of the whip-socket, and the wrench is secured to hoth, the combined device heing adapted to he secured to a vehicle. It consists in such a union of parts as will permit the ready separation of onc from the other, and especially of the wrench from the whip-socket and oil-can, without disturhing the attachment of these latter to the vehicle. It further consists in a modified construction of the top of the wrench, whereby it may serve as a wrench for small nuts, a rein-holder or a hoof-cleaner.

PIPE COUPLING.—John H. Hohart, Oakland No. 315,287. Dated April 7, 1885. By the use of this coupling the length of the pipes may he raised, and at the same time the direction of the pipe may he changed. It consists of two lengths of pipe, the ends of which approach nearly to each other, an exterior sleeve of larger diameter having flexible annular parting rings at each end, through which the first-named pipes pass, and within which they may move and turn without causing leakage.

MACHINE FOR BREAKING WHEAT.—Harry Hudson and Miles Tohey, Salinas, Monterey Co., No. 315,413. Dated April 7, 1885. This is a machine for hreaking wheat preparatory to crushing or grinding it to flour, and the object of which is to remove from the grain what is known as "crease-dust," which is in the seams. The object is to hreak the wheat clean and sharp, wherehy the crease-dust, a portion of the outer hull or hran, and the germs are separated, and to expel the grain from the machine as soon as hroken, wherehy it is not liahle to he too much hroken and little or no hreak-flour is made, as is the case with the machines at present in use for this purpose. The new machine comprises a rotating disk having upon its rim a narrow annular band of teeth, a central feed-vessel with intervening feeders on its surface, adapted to feed the wheat from the center-vessel to the teeth, a stationary vessel or cylinder placed above the rotating disk, and having a notched or corrugated surface on its hottom rim, hetween which and the teeth the grain is caught and hroken, and an encircling band or hoop guarding the apertures formed hy said notched surface, to prevent the grain from discharging directly, and to cause it to fall between the teeth.

THE swarm of hugs around some of the electric lights at Stockton has become so great a nuisance that the City Trustees have held a meeting to consider the removal of the masts to other localities.

Market Reports.

Lumber at Wholesale.

There is a fair trade in lumber, but no special changes in prices. Quotations of cargo rates are as follows for redwood lumber, for delivery at San Francisco, Oakland, Alameda, Berkeley, Vallejo, Benicia, Port Costa, Martinez and Antioch:

ROUGH—No. 1 rough merchantable, $18; No. 2 (refuse) rough, $14; No. 1 rough boards (specified width, 10 inches and over), $19; No. 2 (refuse) do do do, $14; No. 1 rough lumber, surface one side, $21; No. 2 (refuse) do do do $18.

PICKETS—Rough square pickets, $12; rough pointed do, $14; fancy pointed do, $22.

HALF-INCH LUMBER—No 1 ½-inch surfaced, board measure, $40; No. 2 do do do, $39; No. 3 do do do, $38; No. 4 (refuse) do do do, $32; No. 1 ½-inch battens, board measure, $40; No. 2 (refuse) do do do, $32; No. 1 ½-inch siding, 12 ft. and over, h m, $40; No. 2 (refuse) do do do $32; ½-inch siding, under 12 ft, $32.

RUSTIC—No. 1 Rustic, 1x10, 12 ft and over, $33; No. 2 do do do, $32; No. 3 do do do, $31; No. 4 Rustic, 1x10, $28; No. 5 (refuse) do do do, $21; No. 1 Rustic, 1x8, 12 ft and over, $31; No. 2 do do do, $30; No. 3 do do do, $29; No. 4 Rustic, 1x8, $26; No. 5 refuse) do do do, $21.

CLEAR—No. 1 surfaced and rough clear, $32; No. 2 do do do, $31; No. 3 do do do, $30; No. 4 (refuse) do do do, $24; No. 1 surfaced and rough clear, 1x8 and 1x6, $30; No. 2, do do do, $29; No. 3 do do do, $28; No. 4 (refuse) do do do, $24.

[Dimensioned, Surfaced and Rough Clear (widths and lengths), 12 inches wide and over, add $1 ₱ M (on each corresponding grade) to the above list price of "Clear."]

TONGUED AND GROOVED—No. 1 T and G, 1x4, 12 feet and over, $32; No. 2 (refuse) do do do, $24; No. 1 T and G, 1x6, 12 ft and over, $30; No. 2 (refuse) do do do, $24; T and G, 1x6, 7 to 11 ft, $26; do do, under 7 ft, $23.

TONGUED, GROOVED AND BEADED—No. 1 T, G and Beaded, 1x4, 1¼x4 and 1¼x6, 12 ft and over, $32; No. 2 (refuse) do do do, $24; T, G and Beaded, 1x4, 1¼x4 and ¼x6, 7 to 11 ft, $27; do do, under 7 ft, $22.

ROUGH CLEAR—1x6 and under in width, and under 12 ft in length, $24.

[On a credit of 60 days, or a discount at the rate of 1 per cent per month for anticipated payments, and not less than 1 per cent per month added for extension of the same].

We quote cargo rates—Pine—Merchantable Rough, $15 ₱ M; Flooring, $24.20; Stepping, $37 ₱ M; Redwood—Merchantable Rough, $18; Surfaced, $32; Rough Clear, $32; Rustic, $33; Tongued and Grooved, $30; Tongued, Grooved and Beaded, $32.

Lumber at Retail.

Retail quotations for fir and spruce are as follows:

ROUGH MERCHANTABLE—(Ordinary sizes) to 40 feet long, per M ft, $22.50; Rough Merchantable, 1x6, Fencing, $22.50; do do, 1x4, do, $23.50; do do, 1x3, do, $24.50; do do, 1x4, odd lengths, $22.50; do do, 1x6, do $21.50; do No. 2, all sizes, $18.50; do Selected, $26.50; do Clear, other than for T and G and Stepping, $31.

[Rough Clear for T and G and Stepping $1 ₱ M less than price of kind for which intended.]

Dressed T and G Flooring, 1x6, No. 1, vertical grain, ₱ M ft, $33.50; Dressed T and G Flooring, 1x6, No. 1, $33.50; do do do, No. 2, $28.50; Dressed T and G Flooring, 1x3, 1x4, 1¼x4 and over, No. 1, vertical grain, $40.50; do do do, No. 1, $35.50; do do do, No. 2, $29.50; Dressed Stepping, No. 1, vertical grain, $42.50; do do, No. 1, $37.50; do do, No. 2, $28.50.

SPRUCE—Rough Merchantable, ₱ M ft, $21.50; do Clear, $35; Clear Dressed (shelving), $40; Pickets (rough) board measure, $20.50; Furring, 1x2, per lineal ft, 1c; Laths, 1 and 1-¼inch, ₱ M, $3.50; 1½-inch, $4.

[N. B.—For all sizes over 14 inches, and lengths over 40 feet, extra rates].

Pine—Rough, $14.00; No. 2, $11.00; do do in lengths, $12.00; rough, 40 to 50 ft lengths, $15.00; do 50 to 60 ft, $10.60; T and G Flooring, 1x6, $25 00; do do 1¼x6, $27.00; do do 1x4, $27.00; do do No. 2, $20.00; Vertical Grain T and G Flooring, 1x6, $28.00; do do do 1¼x6, 1x4, $30.00; Stepping, $35.00; Furring, 1x2, per lineal ft, 1c.

Redwood—Rough, $16 00; No. 2, $12.00; Surfaced, $30.00; do, 1x8, $28.00; do, 1x6, $28.00; T and G, 6 in. 12 ft and over, $28.00; do do, 7 to 11 ft, $25.00; do do, under 7 ft, $20.00; Rustic, $30.00; do No. 2, $25.00; T and G Beaded, 12 ft and over, $30.00; do do, 7 to 11 ft, $25.00; do do, under 7 ft, $20.00; Siding, ½ in, $22 50; Picket, fancy, $25.00; do, rough pointed, $15.60; do do, square, $14.00; Battens, ½x3 in, per lineal ft, ¾ c.; Shingles, $2.00; Laths, 1¼, $3 25; do 1½, $3.75; Dunnage Boards, less 5 per cent, delivered, $10.00.

Nails.

We give the price list of the Pacific Iron and Nail Company.

FENCE AND BRAD.—10d to 60d, $2.90: 8d and 9d, $3.00; 6d and 7d, $3.25 4d and 5d, $3.50; 3d, $4.25; 2d, $5.50

BARRELS.—¾ inch, $0.75; ⅞ inch, $5.75; 1 inch, $5.25; 1½ inch, $4.50; 1¼ inch, $4.25; 1⅜ inch, $3.75; 1½ inch, $3.50.

LINING.—⅝ inch, $7.25; ¾ inch, $2.75.

TOBACCO.—10d, $3.25 8d, $3.50; 6d to 7d, $3.75.

CLINCH.—6d to 30d, $4.50.

SLATING.—5d, $3.75; 4d, $3.75; 3d, $4.50; 2d, $5.75.

FINISHING.—2d, 1 inch, $8.75; 3d, 1¼ inch, $6.75; 4d, 1½ to 1¾ inch, $4.50; 6d, 2 inch, $4.25; 8d, 2½ inch, $4.00; 10d, 1 inch and over, $3.75.

CASING AND BOX.—10d to 30d, $3.50; 8d, $3.75; 0d, $8.00; 4d, $4.25; 3d, $5.25.

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Mining Share Market.

The transactions in mining shares have reached larger proportions than has been the case for some years. The market is quite active and fluctuations marked. The favorites seem to be the middle and north-end stocks. The Hale & Norcross and Chollar developments are supposed to be the cause of the activity. Concerning this ore the Virginia *Enterprise* says: But it is hardly safe to pronounce it a "bonanza" as yet, or anything more than a first-rate prospect. The ore as developed on the 2,900 is simply low-grade, containing streaks and bunches of rich ore giving very high assays. Even the management and those best posted only claim that the whole mass of the vein will pay well for milling, even from that great depth. If it holds out and increases in extent and richness at a greater depth, then and not till then can this new and important ore development be called a bonanza in the Comstock interpretation and acceptance of the term:

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We invite the acquaintance of all parties connected with inventions and patent right business, believing that the mutual conference of legitimate business and professional men is mutual gain. Parties in doubt in regard to their rights as assignees of patents or purchasers of patented articles, can often receive advice of importance to them from a short call at our office.

Remittances of money, made by individual inventors to the Government, sometimes miscarry, and it has repeatedly happened that applicants have not only lost their money, but their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees intrusted to our agency.

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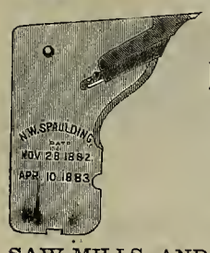

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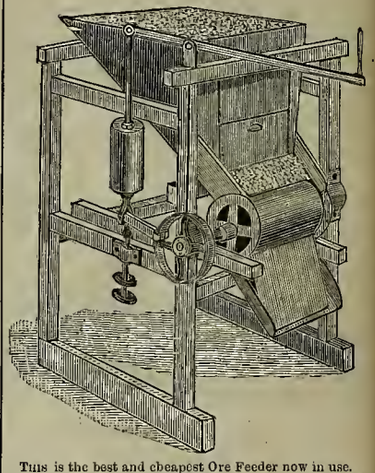
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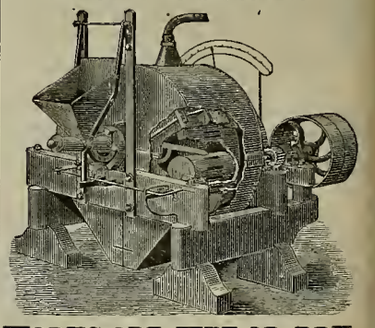
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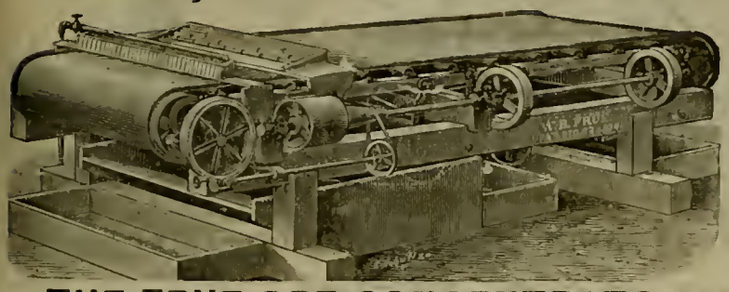

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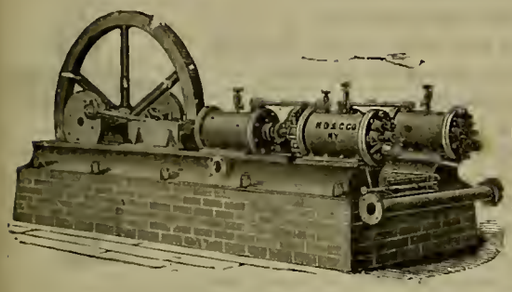

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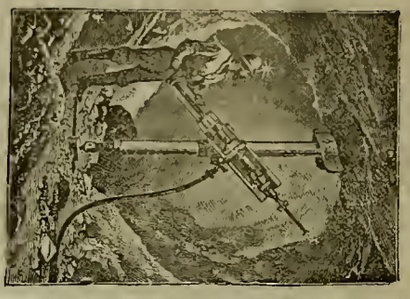

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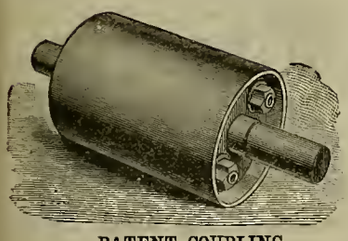

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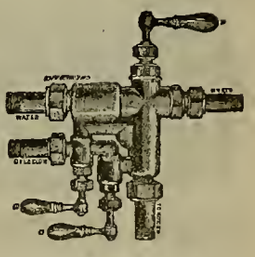

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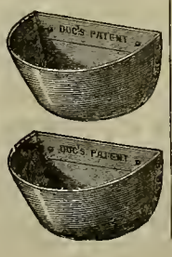

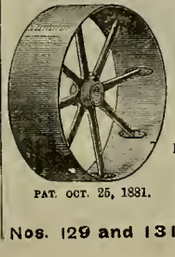

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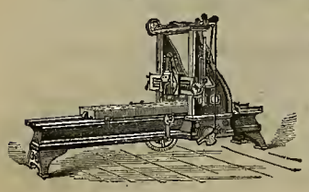

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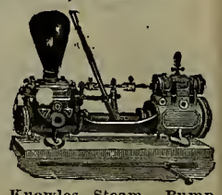

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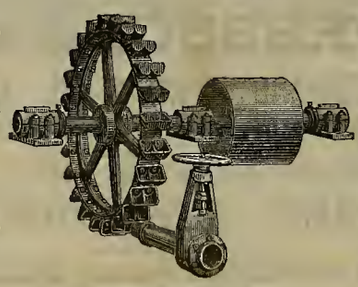

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This machine has been THOROUGHLY TESTED for the past TWO YEARS, under a GREAT VARIETY of CONDITIONS, giving most EXTRAORDINARY results FAR IN ADVANCE of anything EVER BEFORE REALIZED. A recent COMPETITIVE TEST at the Carlisle Mine in Mexico, showed an ADVANTAGE OF OVER 30 PER CENT in favor of THE DUNCAN. The amount SAVED OVER THE FRUE being sufficient to PAY THE ENTIRE COST of the machines EVERY MONTH OF THE YEAR. One of its MOST VALUABLE features is as an AMALGAMATOR. It saves all THE AMALGAM GOLD and SILVER that ESCAPES the BATTERIES, PANS or SETTLERS, making the machine worth MORE than ITS COST for THIS PURPOSE ALONE.

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Possessing all the requirements of a first-class hoist, and affording means for the continuous operation of Pump or Blower, without interfering with a hoisting apparatus. It is made entirely of iron, no piece weighs over 300 pounds. At the ordinary speed of a horse, a 1,000-pound bucket of ore may be raised 120 feet per minute. The hoisting-drum is under the complete control of the man of the shaft, and is capable of carrying 500 feet of five-eighths steel rope. SEND FOR CIRCULAR.

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DIVIDEND NOTICE.

Plymouth Consolidated Gold Mining Co.—23 Nassau Street, New York, March 26, 1885.

DIVIDEND No. 23.—The twenty-third consecutive monthly dividend of Fifty Thousand Dollars, being One per cent on the capital stock, or Fifty Cents per share, will be paid on the sixth day of April, at the Company's offices in New York and San Francisco. Books close on the 4th.

W. VAN NORDEN, President.

A. T. DEWEY, W. B. EWER, GEO. H. STRONG. } Dewey & Co.'s Scientific Press Patent Agency { ESTABLISHED 1860.

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REMOVAL NOTICE.

Notice is hereby given that the principal office of the EUREKA GAS CO. has been removed from the city and county of San Francisco, Cal., to the city of Eureka, Humboldt Co., Cal.

C. S. BACHELDER, Secretary.

San Francisco, March 27, 1885.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, APRIL 25, 1885.

VOLUME XLXX
Number 17.

Beaudry's Upright Power Hammer.

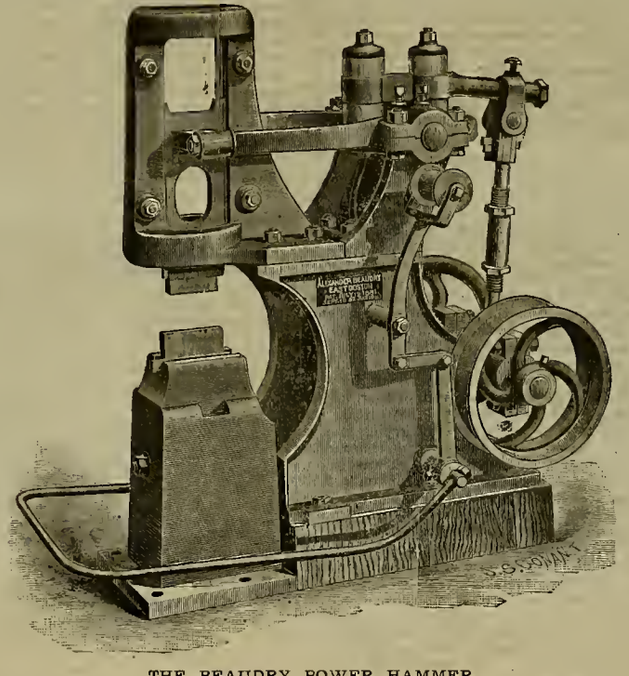
The engraving on this page illustrates the new design Beaudry upright power hammer, which is intended for all kinds of steel and iron forging. It will not only rough out work, but completely finish it, doing trimming, cutting and punching.

A main feature is the arrangement by which the elastic force is given to the hammer. The seat of this is the pitman, on which are placed the heavy rubber springs which give the "snap" to the blow, and which are locked up with bolts so that they do not wear. These strong springs, which are the best that are manufactured, and are made especially for this purpose, have a power which is second only to steam, and give force to the blow, while at the same time yielding so as to prevent concussion. The steel arms also have a vibratory motion sideways, which adds to the weight of the blow.

A most important feature of the working part of the Beaudry hammer is the leather band which passes through a slot in the hammer head, and connects the head and arms together. It is a band of tough raw-hide leather, of three to five inches wide, six times folded, and strongly bolted together. It is found to be better than steel or iron, or any other material which could be used. It is a much more durable article, and while superior in point of strength to anything else in such a position, has the inestimable advantage of being elastic, so as to carry off all jar and concussion. The hammer can be run very economically, the manufacturers stating that the cost of running need not exceed 25 cents per day, while a steam hammer of the same size could not be run for less than $1.75 or $2 per day, besides the necessary help.

No help is required to run this hammer, as would be needed in case of a steam hammer; the smith runs it by simply pressing his foot on the treadle, which extends around the bed, and he can do this equally well, whether standing in front or on either side. The person working the hammer has complete control of it, and can easily regulate the pressure to be applied. The Beaudry hammer has the advantages which a steam hammer of its size, or perhaps larger, have; and, in addition, no pipes or cylinders to freeze in cold weather. At the same time it can be used without alteration for lighter work, such as tool, knife and implement making of every kind, and also for drop work.

The expense required for repairs is so slight as to be inappreciable. This durability is accounted for by the elasticity, previously spoken of, which exists in the rubber springs, the arms and the leather band. These three points provide for and prevent the wear and breaking which must otherwise occur in a machine subjected to such violent shock. These hammers are adapted to almost every kind of forging, from the smallest knife to a five-inch bar of steel or iron; or, indeed, for anything up to the point where a large steam hammer is needed. They are made in all sizes from the smallest upward. Every hammer is carefully tested by actual work before being delivered. The anvil is entirely separate from the frame, relieving the frame and the entire hammer from the jar and strain. When the pressure is removed and the hammer stops, the head always remains up, leaving a space of from four to twelve inches, or even more, between the dies, so that it is again ready for immediate use. The blow is a direct upright blow, and is given with the same elasticity as by a blacksmith's arm, and thus does not chill the work. It can be so nicely graduated as to strike with a force of from two ounces to two thousand pounds or more, and this can be done instantly, without any alteration. The stroke can be changed from a short stroke to a long one by sliding the regulator back or forth. The connecting rod is made adjustable with a turnbuckle, so that the ram can be raised or lowered by this means, if necessary. The head does not vibrate, as it is secured in vertical guides, which are made in two pieces, with wood inserted between them, so that if there should be any wear or slack, the wood can be shaved down a little, which will take up the slack. These implements are useful to manufacturers of all descriptions, railroad shops, steel and machine forgers, cuttlery makers, agricultural implement makers and all others who need such tools. The agents in this city are Messrs. Morris & Varney, No. 24 Fremont street.



THE BEAUDRY POWER HAMMER.

Montana Mines.

We had a conversation this week with Mr. N. A. Foss, who has been a resident of Montana some years, and who has been engaged in smelting operations in that Territory. He speaks of Butte as the greatest mining camp of the United States, but says the low price of copper has been and is detrimental to its interests. Moreover, as the mines are deepened not as much silver is obtained as nearer the surface. It is his opinion that Montana mining interests will never be as prosperous as they should until the rate of wages is lowered. They are just as high now as five years ago, while the necessities of life are much lower in price, being brought in by the railroads. The high rates of transportation are also injurious to the section, and these must in time be lowered also. Should wages continue as at present, and transportation rates as high some of the smaller works will have to close, and the copper mines will go more into the hands of the larger concerns. The Butte ores are very easily worked, but with the present conditions, and low price of the product, little or no profit can be made.

Mr. Foss says times are just now dull for Montana, as they are elsewhere. A great many people are coming in all the time, in fact, more than can get work. There is a heavy immigration this spring and the trains are crowded, though many are going through to Oregon and Washington. He says *good* miners can always find work. There are numbers of men there who have previously done little or no work in the mines, and experienced men are in demand. At Maiden, for instance, good miners are scarce.

Our informant does not express a very high opinion of Montana farming resources. It is too cold a country for very successful farming. The main dependence is on mining, cattle and sheep. The farmers used to get high prices for their products, but the railroads have stopped that and can bring it in cheaper than it can be produced in so cold a region. There is little sale for farm products when competing prices are considered.

The American Institute of Mining Engineers will hold its forty-third meeting at Chatanooga, Tennessee, beginning on May 19th. No special railroad facilities are offered on this occasion, as nothing better could be secured in this respect than the rates now ruling in connection with the New Orleans Exposition.

The miners on the Klamath are all busy rigging up wheels, derricks and pumps, and getting out material for wing-damming. The season opens early and will be one of the most profitable yet employed by river miners.

Mining assessments falling delinquent in April amount to $133,000, of which Nevada mines want $66,000 and California $67,000.

New Ore-Crushing Rolls.

Wm. E. Wild, of this city, has patented, through the Mining and Scientific Press Patent Agency, an improved ore-crusher of that class on which heavy rolls are used. The main frame is made of heavy timbers and a fixed roll is placed in suitable boxes at one end. This roll is driven by pulley and gears in the usual way. A yielding or movable crushing-roll is also used. It has been customary to drive the roll by gearing it direct to the fixed roll, and in order to provide for its various changes of position the teeth of the driving gears are made of some length. The objects of Mr. Wild's invention (in which Mr. George E. Ames is interested) is to provide a separate sliding frame and driving mechanism for the yielding roll, whereby the wear and tear on the machine, and especially the gears, is reduced, and also to provide a means for adjusting the movable roll and for receiving the sinking pressure of the sliding frame.

On the main frame are fixed guide tracks, on which is mounted the sliding frame. In this frame is mounted the shaft of the movable roll and also the shaft carrying the driving-pulley and pinion which meshes with the master-gear. These constitute the driving mechanism of the yielding roll that is independent of that of the fixed roll. Being on the sliding frame all these parts move together, and the variation on the driving-belt caused by its movement is so slight as not to be of consequence.

There are four bolts, two of which lie above the sliding frame and two below. The heads of these bolts are firmly secured behind suitable brackets on the main frame, and their ends extend beyond the sliding frame and carry a plate which is held by nuts on the bolts. Between this plate and the end of the sliding frame is an elastic cushion, preferably a rubber buffer. The cushion is carried by the plate, and receives the backward motion of the sliding frame and forces it forward again to keep its roll to its work. By setting up the nuts on the bolts the sliding frame, with its roll, may be accurately adjusted and all the working pressure of the frame and roll is borne by the plate and bolts, whereby little or no strain is brought on the main frame.

The resisting-plate is made the weakest part of the machine in order that under great pressure, as where work is very hard, or some hard foreign substance forces its way between the rolls, it may be the first to break, thus saving other and more important parts of the machine.

The operation of machines with crushing rolls is well known. The ore is free down between the heavy rotating rolls and is crushed by them. One of the rolls yields slightly to prevent choking and breakage of any parts. By Mr. Wild's improvements each roll is driven by its own mechanism, and the machine is compact and strong. In localities where the rock is not very hard and there is no necessity of having the rolls to yield, it can be made rigid by substituting a block of wood for the elastic buffer.

Fifty-three gold deposits, amounting to 13,030 ounces, were made in the Helena U. S. assay office for the year ending March 31, 1884. For the year ending March 31, 1885, 169 deposits were made, amounting to 23,507 ounces, showing an increase over 1884 for the same period of 10,477 ounces.

Cleveland is the name given a new mining district recently discovered in Mono county.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

New Mexico.

Black Hawk District.

[From our Traveling Correspondent.]

The camp of Black Hawk lies near the foot of Bullard'e peak, Grant county, about 18 miles weet of Silver City. The place has produced a great deal of bullion. The recent renewal of work on the deepest mine in the camp, and the discovery of rich eurface deposits have given an impetus to tbe mining interests and a general activity to a more thorough work in prospecting. Tbe great depth attained by some mines and tbe existence of ore in well-defined veins 550 feet deep, indicate most forcibly that tbe place can be relied upon as a deep mining district. The surface development of many properties have produced some wonderful deposits of native silver. The entire district has been taken up and mining men of experience are investing in all the property they can secure. Regular shipments of ore, a majority of which will run over 300 ounces to the ton is the order of the camp's output. The following mention of the leading and most extensive developed mines will give the readere of the PRESS an idea of tbe camp's prospects as a future hullion producer.

The Black Eawk is tbe pioneer mine of tbe district. To its discovery the camp, district and the many makings of mines in this vicinity owe tbeir existence. This property is entitled to the distinction of being a mine in every sense of tbe word. The marveloue deposits of sulphide and native silver taken from tbe property as surface development and depth was made caused it to be epoken of among miners as "the solid silver."

Formations and Ore.

The formations are syenite and porphyry, tbe latter appearing in dykee cutting the veine in singular and perplexing shapes. The ore bodies occur in pocket and cbimney-like deposits, always near the porphyry. Sulphide and native silver, especially tbe latter, is the "stuff" found in these deposits. The dip of the vein from the surface for a depth of 100 feet is perpendicular. From that depth to the 500-foot level the incline is 45 per cent to a fraction. Ore bodies, some of which were nearly solid native silver, were uncovered quite frequently from the surface to a deptb of 225 feet. From this depth to the 325-foot level the vein proved to be entirely barren. From the level the vein appeared to widen out into a large broken stratified body eome 20 feet in width, and no deposits were found, notwitbstanding a thorough development of the "busted" body was made to the 500-foot level.

New Discoveries.

At a depth of 500 feet an east drift was made to determine the length of tbe break-up of tbe vein. In the progress ot this tunnel a vein was cut, the conrse of wbich is nearly parallel with the Black Hawk vein proper, and is some 30 feet from the same. The existence of this vein was unknown heretofore, and the discovery of rich ore deposits in the same indicate a renewal of the output of by-gone days. This new vien, and the discovery of the Black Hawk vein proper in a more firm shape in tbe 550-foot level, would be sufficient encouragement to a California company to go down deep on the Black Hawk and up to the surface on tbe new vein. High-grade ore is heing taken out of tbe rediscovered vein in the 550-foot level. With two splendid mineral-bearing veins at such a depth the management will staud in their own light if they work tbis property in the we-muet-take-out-the-money-in-advance-to-work-tbe-mine plan. The ores of the dietrict are, with few if any exceptions, found in pockets, these deposite occurring near porpbyry. This mine now has two veine; their present development ie near a porphyry dyke. The dip of the veins do not justify the belief tbat tbey will emerge one into the otber unless it be at a great depth, or by a sudden change in the course of one or the otber a little deeper. If these veine concentrate below thie, and the deposits continue to oocur, the deep mining qualities of the dietrict will be an aseured fact and the exteneive workings of the many rich surface properties will speodily commence.

How the Mine Is Worked.

Tbe management of the property is in the hands of H. H. Rich, who is vice-president and a ebareholder of Black Hawk stock. The superintendency of tbe mine devolvee on I. L. Merrill, a practical miner—a man of much experience and knowledge of tbe many peculiarities of the mineral-bearing formations of tbe dietrict. The great depth of the mine has necesitated the placing of an engine at the end of the 250-foot north-east drift on the 500 foot level. This engine is run by steam, conducted from tbe eurface by pipes, and ie used in hoisting ore and rock from the 50-foot incline eunk on the rediscovered Black Hawk vein. The ore and water tubs are transferred on care to the foot of the main shaft and hoisted to the surface without change. The etopes and drifts, either in search of ore or in their extraction have been intelligently directed and every detail of the development of the property looked after in a manner that should win for Superintendent Merril the approbation of the company, as it certainly does the approval of the mining men who have seen the underground workingo f this property.

Eaetern Capital Invested.

The majority of the stockholdere of the Black Hawk are Eastern men; hence the timidity exhibited in the past workings of tbe property. The recent development may spur them up to push tbe work. H. H. Rich, general manager, is one of Grant county's prominent mining men and if he is not instructed to test the property fully and extensively, it will be because retrenchment is desired for the purpose of bnying up stock. Tbe developments recently made and tbe good indications for the future as they exist to-day in the Black Hawk would, if they appeared in some mines, boom the stock and insure more extensive development.

The Rose Mine.

Black Hawk's present activity and the prominent attention the camp is receiving from mining men and capitalists is principally due to tbe recent developments in this mine. The history of tbe mine'e location, the litigation and numerous claimants of the ground show a general knowledge of the richness of tbe ground. The mine is 600x1200, is one mile west of Black Hawk, and is owned by Colorado and Minnesota capitalists.

The Formatione and Ores.

The formatione of tbe Rose are peculiarly her own. The early history of the mine tells of four locations being made on tbe eame ground by ae many different claimants; a claim upon a claim, ae it were. Two well-defined mineral producing veins cross the mine; a mine witbin a mine, as it were. The course of tbese veins is such as to cnt across each other nearly forming the letter X. Strange as it may seem, they both dip in tbe same direotion, the highest one on the hill baving a dip of about 47 degrees, while tbe lower vein is nearly perpendicular. Tbe ore or vein matter of the upper ledge is a redish sedimentary matter lying on a solid, well-defined porphyry foot-wall; tbe country rock being eyenite and at times a porphyritic shale. The pay streak varies in width from six to 24 inches; at times taking a more solid formation, running wonderfully high in cbloride, sulphide and horn silver The ore in the lower vein is principally spar, from 15 to 30 inches thick, laying between porphyry and granite, and running bigb in native, horn and occasional streaks of ruby silver.

Development.

Vice-president R. H. Wellington, as general manager, essisted hy E. M. De La Vergne as superintendent, directs the progress of development. To tbese gentlemen their associates owe a debt of gratitude for so speedy a return of their investment and an economical, progressive management of this excellent property. Open cuts about 10 feet deep on both veins have exposed the ore from tbe gulch on tbe west over and across tbe hill to the bed of the canyon on the east. An incline sbaft at the summit of the bill, on the upper vein, is down 35 feet on ore. On the lower vein a 60-foot tunnel in the west gulch has followed a rich vein of spar, and at the breaet of the tunnel tbe pay-etreak bas widened to a 16-inch spar vein carrying native silver. Directly over tbe breast of tbis tunnel tbe same native eilver-bearing rock was taken from the open cut. In the east canyon a tunnel has been started to tap the incline, now down 35 feet on tbe upper vein. Tbis tunnel will tap the incline at a depth of nearly 75 feet. Sedimentary vein matter tbat runs 205 ozs. is beiug taken out of the open cut in wbich tbe tunnel is to start. From many places in tbe open cuts that mark the course of the veins across the Rose ore hae been extracted that runs eo high in native and horn silver, as to be almost incredible. Tbe expenee of development eo far has been very emall. The first carload of ore ehipped from the Rose wae valued at $20,000. The present management bas had charge of the mine eince March 6, 1885. A month'e work that will bear comparison in labor accompliehed, output in ore, and economy practiced, will be entitled to a like praise and emulation by mining managers and superintendents.

The Management.

The Roee is owned moetly by Colorado people. Dr. N. S. Culver, of Colorado Springs, president; R. H. Wellington, of St. Paul, Minnesota, vice-president and general manager; E. M. De La Vergne, euperintendent; Geo. R. Buckman, secretary; John Kerr, treasurer. Col. De La Vergne, aleo of Colorado Springs, is a large stockholder and one of the directors of the company. Tbe officee of the company are at Colorado Springs, Colo. The names and addreeses of tbe owneree are given merely to ehow that Western capital is coming to the front in purchasing and developing first-class mining property in a legitimate, bueiness like manner. The richness of the Roee, and the indicatione of a continuance of her phenomenal output of high-grade ore, make it more than likely that no stock will be sold, notwithstanding the organization of the company and the preparation of the stock for the market.

Concentrates.

A daily stage line connects Black Hawk with Silver City, distance eight milee, for $12.

Minere' wages are $3 and $3.50 per day. Board, $7 per week.

Two cars of ore evory 30 days are the Black Hawk's shipments. These cars return from $4,000 to $8,000 per car.

Assayer Edgar M. Hand does the assaying for the camp. He ie a rising young metallurgist.

The Blue Belle, with but little development, has produced $9,000.

The Silver King showe native silver as work progresses. They are now down 75 feet.

A miners' skating rink estahlished here seems to keep them from saloons and gambling houses.

Colorado capital is tho most heavily invested hereabouts. California, however, is crowding in and obtaining a good foothold in this excellent district.

Minnesota and Illinoie capitalists, judging from the number interested hereabouts, know when they get into a good locality, even if they do push development with a tight breecbing.

Western mining men in this camp who go ahead on good indica ions and investigate a mine for everytbing there is in it, bave been, and will continue to bs succcessful.

F. W. S.

Sierra County, N. M.

[From Our Traveling Correspondent.]

This is the haby county of the Territory; being formed from ricb and liberal slices of the counties of Socorro, Dona Ana and Grant. The birth dating in March, 1884. The taxes are two per cent and the assessable property for the year is over $2,000,000. Mining and stock-raising are tbe leading and in fact tbe only industries; the former being tbe leading.

Principal Districts.

Lake valley is the principal southern district of the county. A good-eized mining camp bearing tbe same name as the district, is located at the terminal of a branch of the A. T. & S. F. twelve milee distance from Nutt on the main line. Here are located the Sierra Grande mine, also the Sierra Bonanza claims. The former mine is owned by Philadelphia people and tbe great wealth it bas produced and tbe thousands it has cost the quaker and other Eastern stockholders has given the Sierra Grande a standing that belies the old saying, "out of sight out of mind."

A Wonderful Mine.

Tbe Sierra Grande consists of four claims. A 20-etamp mill and a concentrator adorn the grounds. Tbe mill is the Boss process, with wet pan amalgamation. The ores lie in small and large heds nearly flat, varying in thickuess and in richness; the composition being iron manganese heavy in chlorides. The free milling ores of the mine do not predominate, hence tbe heavy ebipments to Pueblo. The ores run from $10 to $2,000 per ton, the latter grade not being so frequent of late; the surface workings resemble an old iron quarry. Occaeional deposits of wonderfully rich ores gave tbe property a reputation very much like the fahle of "Aladdin's lamp." The marvelous richnese of tbe "Bridal Chamber" of the Sierra Grande, a deposit of ore but 30 feet helow the surface, from which over one and a quarter millions was taken, is still fresh in the minds of minere and mining men of the Coast.

Big Ore Shipments.

During the brisk days of tbe Sierra Grande'e prosperity a regular shipment of from 250 to 300 tons was not an unusual occurrence. As high as 600 tons was dispatched from the minee in twenty-four hours. At preeent this property is working with a reduced force and the air is full of rumors about Lake valley as to the ceuse of the discharge of over 100 men on the 1st inst. The past record of this mine has demonstrated the fact, at more timee than one, that the management of a mining property by Eastern meu is not as often a euccees as when handled by a Western man. Like all mines which depend on the high price of their stock to enrich the "inside" and gull tbe credulous, the management declines to allow the press or public accees to the mine.

False Economy.

The recent reduction of the force of the Sierra Grande mine, hy letting over 100 men go is, eo the Lake valley office says, a Quaker notion that the eame output can just as well be had with less meu. The general manager and his superintendents and officials, I am told, draw a princely salary (this is generally the caee with stock companies' mines). Special trains over the branch are the order of thinge when the management desires to go East or West or is returning home from such trips. Of course this is none of the stockhoders' husiness unlees they have to pay for it. To a practical business man it certainly looks as if a reduction in exhorbitant salaries, extravagant expenditures and the erection of eome feaeible and suceeseful machinery for the treatment of ore would result in an incrcase of output and a more frequent declaration of dividends. The freight paid out would in a short time pay for the erection of machinery for the treatment of ores.

The Sierra Bonanza.

The claime of this company adjoin the Sierra Grande on the north. The litbograph menu-like prospectus of the company, recently issued from the New York office of the company, reads like the first chapter of a dream of love or the realization of a "Monte Christo." A Philadelphia mining paper says: "We sacrifice all false delicacy (as to heing influenced) and for tbe first time officially endorse all that bas been previously published in these columns." The paper then predicts a future for the company, that if true, would canse the management to gobble up all the stock and freeze out every mother's son of a stockholder that beld a share in tbe property. Owing to a disinclination of stock mines in this viciuity to admit representatives of coast mining papers, in search of facts and informatiou on legitimate mining and mining methods, tbe Sierra Bonanza's property was not visited. Its proximity to the Sierra Grande justifies its dream of future millions on the Grande's past record of occasional strikes. This mine, as well as all others like it, will pay to invest in as follows: Bny 'em when they are low and sell 'em when tbe're high.

Hillsborough.

Eighteen milee northerly from Lake valley are the placers and quartz mines of Hillsborough. The placers are ricb, but not extensively worked on account of a scarcity of water. The gold and silver ores of the district are more or less worked, and in mauy cases produce bullion in paying quantities. Over $300,000 bas been sbipped from tbe mines of tbis district. The ores are both milling and smelting, the former predominating. A 10-stamp mill produced $22,000 in a four montbs' run. A dry-crushing process is necessary, by whicb it is estimated from $20 to $90 per ton can be saved from the minee of tbe district. The ores carry a great deal of pyrites of iron. The wet-crushing process is not a success owing to tbe existence of more or less manganese and some of the ores requiring roasting.

The Mines.

The most extensively developed propeity is the Compromise, Nos. 1 and 2, owned by Hopewell, Cosgrove & Co., Hon. N. Galles, superintendent. Some 2,000 feet of development has resulted in enhancing the value of the property and opening up tbe mineral-producing ground quite extensively. Tbe vein matter is about nine feet wide, the pay-streak averaging three feet in width. Three thousand tons from this property averaged over $10.50 per ton, by a treatment which failed to save the percentage that the dry process would have saved. The Bull of the Woods, owned by O. F. Gentz, runs over $85 per ton, the greater part of which is gold and silver. There are numerous other mines bereabouts that are equally as good, and the erection of the proper methods of treatment and a local market for ores is all that is necessary for the future prosperity and wealth of Hillsborough.

Kingston.

This camp lies 12 miles north of Hillsborough, the county seat. For a camp with an unusually bright future, very little is heard of it outside of ite immediate vicinity. There are two good and sufficient reasons for the meager advertising Kingston gets. First: If the actual facts were told of the mines about the camp, they would read too much like a romance to be believed hy the capitalist or mining man of ths Coast, and to the tenderfoot of the East the information would smack strongly of a prospectus of a district etock company, wbo offered thousands for as many dollars. Second: There are a number of mine-owners and companies in this district who, for good reasons, desire sileuce verging on a dense ignorance about ths mines of the district. In the "sweet by and by," when the poor miner has been bought or froze out sufficiently and a quantity of high-grade ores running from 200 to 1,000 ounces and upwards, sufficient to pay for all the property and labor of theee "black cappers" to the camp's prosperity, and these ehipments are made at the ratee paid on 100-oz. oree; then will Kingeton's merits ae a mining camp become known. The probahilities are that the information, at that time, will be a costly one to hoth outside capital and dealers in the stock companies that promisc to epring up here in the futurc.

The Formations.

The geography of the Kingston dis'rict is very much like that of the foot-hills of the Sierras. Towering pine-trees, running water and a permanent and regular mineral belt completes all the requisites of a desirable mining district. Tbe contact lies between porphyry and lime, and in some placee shale taking ths place of porpbyry. There are no fissures, the vein matter occuring in large or small hodies in the lime. Iron mangauesc, chloride and sulphide of silver carrying eome copper and lead conetitute the ores of the immediate vicinity. The place is a bona fide high-grade camp. Anything less than 100-ounce ores are deeignated as low-grade. There is a diversity of opinion among mining men as to there being a efficient per cent of lead ores in the district to smelt the dry ores. Time, and the development of the propertics carrying the moet lead, only will settle thie dispute. At present lead ores are being hrought in from other districte, and in some instancee from Old Mexico. There is hut little free milling ore in the Kingston District.

The Minee.

There are a dozen or more regular bonanza mines. Some of these minee were bougbt for a mere song, ae it were; others were honded for thousande, and the money with which they

(Concluded on page 270.)

Mechanical Progress.

Steel vs. Iron Nails.

Notwithstanding the bitter opposition to them, steel nails seem to be rapidly winning their way into general use. What one of the labor papers terms the "vigorous boycotting" of the steel nail by the carpenters and contractors of Wheeling appears to have had but little effect, as the demand upon the nail-mills in the Wheeling and Pittsburgh districts is almost exclusively for steel nails. The iron nail mills in those sections do but little work, and even the mills that make both steel and iron find that their steel nails move off freely, while for their iron nails there is scarcely any demand. As a result of this steel nails are being made in increasing amounts, and even those mills which have heretofore refused to make steel nails, or have made them but sparingly, are making arrangements to very largely increase their product of steel.

A California view of the nail question is expressed by Geo. T. Walker, of the Pacific Nail Company, in a recent interview with a *Bulletin* reporter, as follows: "Steel nails are drifting into use, and for some purposes will soon be used to the exclusion of iron nails, and, taking everything into consideration, steel really is cheaper than iron. The Pacific Nail Company are already prepared to make steel nails, and will make them of equally good quality with any produced."

The reporter also saw Henry T. Scott, of Prescott, Scott & Co., who expressed himself in regard to the general iron interests of the State, as follows: "At present the demand for manufactured iron on this Coast is lighter than it has been for five or six years, and nearly every manufacturer has already laid in his stock of pig-iron, and at prices above those for which it could be obtained now. Pig-iron of American manufacture here meets with serious competition from English and other European metal, which is brought over for ballast by ships coming for wheat cargoes. European iron formerly formed about 75 per cent of the total amount used; but, owing to the establishment of new manufactories here, the proportion will now, probably, hardly exceed one-half. In a short time, it is thought, the Pacific Coast furnaces will be able to produce all the pig-iron demanded by Pacific Coast manufacturers."

Tempering.

When tempering cold chisels, or any other steel articles, says the *Age of Steel*, heat to a very dull red and rub with a piece of hard soap, then finish heating and harden in clear, cool water. The potash of the soap prevents the oxygen of the atmosphere from uniting with the steel and forming rust or black oxide of iron. The article will need no polishing to enable the colors to be seen. This will be appreciated when tempering taps, dies or various complex forms not easy to polish. Never "upset" a cold chisel. It is sure death to steel. Many of us have lived on a farm and know something about a bundle of nice, straight, clean straw. If you work it intelligently you can tie it up into stout bands for binding other bundles. You can take hold of the ends of that straw and draw out a handful without harm to the straw. After you have drawn out half that bundle a foot or so, try to drive it back; every blow breaks the straw, cripples and doubles it up, and it will hardly bear its own weight, to say nothing of making a band for other bundles. Just so with steel. If you have a broken chisel to sharpen, draw out and cut off, never upset. It will cripple the fibers just as the straw is crippled when driven endwise.

Make chisels short for hard, rough work. They transmit the power or force of a blow much better. Long chisels are apt to "broom up" on the hammer end, as the long steel through which the blow passes has more chance to absorb the force of the blow.

The harder the metal to be worked, the quicker the blow should be transmitted. Cast-iron works much better with a short steel chisel and light hammer, than if the blow was struck upon a very long chisel with a heavy wooden mallet. In one case the blow is delivered all at once, in the other it takes time, and much of the force is absorbed.

Steel Converters and Their Effect on Prices.—There are now 23 steel works, having among them 80 converters, in the German Empire; Austria and Hungary have 12 steel works, with 34 converters; Belgium, 3 steel works, with 18 converters; France, 7 steel works, with 14 converters; England, 23 steel works, with 115 converters, and Russia 5 steel works, with 10 converters. By means of the new processes the price of steel has been reduced in this country from $99.70 in 1882, to $30 in 1884. The reduction in England has been from $67.30 to $22.20 in the same time. The reduction in England has been only $45.11; while in this country it amounts to $69.70.

An Ingenious Process.—Lebasteur has invented an ingenious process for determining the thickness of iron plates in boilers, or in other places where they cannot otherwise be measured without cutting, which process is described in a French technical journal as follows: "He spreads upon the plate the thickness of which he desires to find, and also upon a piece of sheet iron of known thickness a layer of tallow about a hundredth of an inch thick. He then applies to each for the same length of time, a small object, such as a surgeon's canterizing instrument, heated as nearly as possible to a constant temperature. The tallow melts; and as in the thicker plate the heat of the cautery is conducted away more rapidly, while in the thin plate the heat is less freely conducted away, and the tallow is consequently melted over a larger area, the diameters of the circles of bare metal around the heated point, bounded after cooling by a little ridge of tallow, will be to each other inversely as the thickness of the plates. The process is stated to have given, in the inventor's hands, results of great accuracy.

Skilled Mechanics.

Speaking of the position and prospects of the skilled workman and mechanic, the *American Machinist* remarks:

No matter to what extent the refinement in machine tools may be carried, it is in the end the careful and painstaking operation of the skilled mechanic that must bring the products of these tools to a perfection that will meet the requirements of modern demands. The lathe will not turn so round that, in this respect, its production cannot be improved by the hand work of the skilled machinist, nor will the milling or planing machine produce surfaces so true that he is not called upon to rectify them with file and scraper. Now, as ever, the beautiful finish on iron and steel is the result of the individual effort of the operator, rather than of the perfection of tools.

Years ago, the opinion prevailed to a considerable extent that the services of the highly skilled mechanic would not be so much a matter of necessity in the future as in the past, but those who built on such ground built poorly. The man will always be superior to the machine, and must always see better than he can perform.

One man may direct the efforts of 50 skilled workmen to the production of good work, but 50 men cannot get good work from one unskilled workman. Improved tools and mechanical appliances will simply assist the artisan in the production of fine work, but the greater the refinements of these tools and appliances the greater must be his skill. Instead of relieving him of his responsibilities, which would be in every sense a misfortune, they add to them, which make him, in every way, the better in being able to meet them.

Altogether, the position of the skilled mechanic is in every way satisfactory, in its relation to improved machine production, and the tools and appliances of the future, however refined, can never usurp his place in the industries of the world, nor relieve him of the part he is to play in future mechanical advancement.

Personality in Tools.—An experienced foreman who has an eye for philosophy says that tools apparently partake of the temper of those who use them. A short-grained man generally has nicked bits; the impetuous man broken ones; the lazy man dull ones; the careless man badly dressed ones; the man of one idea one dress for all kinds of work; the soft man can rarely keep the edge of a tool from turning, while the good-natured and even-tempered man always has the best tools in the shop, and is pestered continually by ill-tempered workmen who come to borrow from him whenever they have a particular piece of work to do. It is quite interesting to note the similarity in the temper of the workmen and their tools.

Bearings for Journals.—A well-known and competent mechanic states that he obtains the best results on his swiftest moving journals with cast-iron on cast-iron, and says he is willing also to depend on an emery ground fit. Another, equally competent, says that for exceptionally high speeds, as 4,000 per minute, cast-iron and cast-iron are inadmissible, but he employs untempered steel and hard babbitt-metal well hammered into the box and then bored out. He tried hardened steel boxes and soft steel spindle for that speed, and found that the boxes cut so rapidly as soon to destroy the spindle as well as the boxes.

Steel Displacing Puddlers.—The substitution of steel for iron in the Pittsburg mills is fast taking away their occupation and driving them to seek employment elsewhere. Within the last two years not less than 2,000 men have left that city, having been thrown out of employment by the introduction of machinery for the production of steel. One hundred puddlers left on the 15th inst. for New Zealand to work in a large iron-mill, where the ordinary puddling operations have not given way to the new steel processes.

Galvanizing Wire.—A New England firm has introduced a new process for galvanizing wire. It is claimed that by this new method a thorough union of coating with the body of the wire is secured, and that in every case a smooth, firm surface results. Great softness, tensile strength and uniformity of temper are also said to be obtained in the wire, while the coating itself remains intact after the wire has been tested by severe twisting.

Scientific Progress.

Zylonite—A New Paper Product.

One of the most remarkable uses to which paper has been put of late years, says a contemporary, is the manufacture of zylonite, a substance which, at the will of the manufacturer, may be made in imitation of horn, rubber, ivory, tortoise-shell, amber and even glass. The uses to which zylonite are adaptable are almost infinite, but perhaps the most extraordinary is the manufacture of cathedral windows. The discovery was made by an Englishman named Spills, about 15 years ago, but it was only about five years ago that a company was formed in London for its manufacture. Within the last two years a company has been formed here. The basis of zylonite is a plain white tissue paper, made from cotton or cotton and linen rags. The paper being treated first with a bath of sulphuric and other acids, undergoes a chemical change. The acid is then carefully washed out and the paper treated with another preparation of alcohol and camphor. After this it assumes an appearance very much like parchment. It is then capable of being worked up into plates of any thickness, rendered almost perfectly transparent or given any of the brilliant colors that silk will take. It is much more flexible than either horn or ivory, and much less brittle. Combs or other articles made of it in imitation of tortoise-shell are said to be so perfect in appearance as to deceive the eye of the most practiced workman in that substance. The difference in the materials can be detected only by tests. A plain white tissue paper also forms the basis of celluloid, and the treatment in the early stages of preparation are somewhat similar. The chief difference, however, between celluloid and zylonite is that the former cannot be rendered transparent, and therefore cannot, like the latter, be made to imitate so many different substances.

Influence of the Moon Upon the Earth.

Prof. Ball, the astronomer, tells us that the ocean tides, which are caused by the moon's attraction, operate as a brake upon the rotation of the earth on its axis. The moon is very slowly receding from the earth, and as the earth's daily revolution is being continually retarded, the days are growing longer in the average. The matter is not likely soon to become a factor in determining the time or wages for a day's work, since the day only lengthens about one second every 1000 years. The change, however, is constant, and will go on until the earth ceases entirely to revolve.

Some 50,000,000 years ago the moon was so close to the earth as almost to touch it, and spun around the earth every three hours. It is one of the gratifying facts that while many of these calculations can be made with great exactness, the circumstances are such that an error of a few thousand centuries is of no particular consequence.

The speed of a smaller body around a larger one is retarded as the smaller one recedes. This fact will account for the rapid revolution of several of the satellites of our system. Such satellites are of comparative recent origin—have been but recently thrown off from the planet system which they attend. As they recede, the time of their revolution will increase; and that for two reasons—first, from their greater distance the action of gravity is lessened, and second, because from their greater distance the path of their orbit is proportionately lengthened.

The revolution of Saturn upon its axis is now very rapid. Probably long before it becomes cool enough for habitation, for the reason given above, its day will be increased to quite the length of that of the earth.

Stellar Statistics.—The number of stars visible to the unassisted vision on a clear night is about 3,000. The opposite hemisphere, containing as many more, makes the number that can be seen without a glass about 6,000. These are divided according to their apparent brightness into six classes, called respectively, first, second, third, fourth, fifth and sixth magnitude. Stars so remote as to be invisible to the naked eye are called telescopic stars. These are classified as high as the fourteenth, or higher, magnitude. An arbitrary division has been agreed upon for the convenience of astronomers. Twenty are classed as first-magnitude stars, 65 as second-magnitude, 200 as third, 450 as fourth, 1,100 as fifth and about 4,000 as sixth. The number of telescopic stars is much larger, being reckoned by some authorities as high as 20,000,000.

Alloys of Iron or Manganese, or Iron and Manganese, with Tin.—Messrs. Charles Billington and John Newton, brass-founders, Longport, Staffordshire, claim as their invention the alloying of the before-named metals, and after alloying same, they add them to copper or copper alloys, and call the resulting alloys "ferro-manganese bronze." What they mean by copper alloys is copper and tin, with or without zinc, or copper and zinc, with or without tin or lead, or copper, tin and lead with or without zinc. They know that iron and manganese, either separately or combined, or in the form of "ferro-manganese," have been previously used to improve alloys of copper; but the methods employed have great inconveniences, requiring very high temperature and forming uncertain results. Such objections are, however, obviated by the methods hereinafter described. In putting their invention into practice they have a suitable bath constructed for the melting of tin, and keeping the tin at a given temperature, at which they introduce iron or manganese, or iron and manganese, not previously alloyed. To the iron or manganese they attach wires from a dynamo-machine or battery, and upon completing the circuit, the currents of electricity throws off the iron or manganese, or iron and manganese, into the bath of tin, thereby causing an electro-chemical action between the metals, which causes the before-named metals to alloy with each other in such proportions as may be suitable for required alloys. The percentage of iron or manganese, or iron and manganese, in the before-named alloys, can be regulated with the greatest accuracy.

The Planet Saturn.

The observer who beholds Saturn with even a very small telescope at this time, gazes upon a magnificent picture of astronomical beauty. "Observers skilled in planetary lore," says the *Scientific American*, "see evidences of change and commotion in the ring-girdled orb. Astronomers of high repute think that the rings are drawing nearer to the planet, and will eventually fall upon it. Others of equal renown—and here the evidence strengthens and accumulates—feel sure that great changes are taking place in the dimensions and density of the golden girdle, unique in the universe so far as our observation extends. The theory is generally accepted that the Saturnian rings are made of myriad satellites forming a kind of cloud, that the divisions of the ring are real, and that we see between them the black background of the sky. A different theory finds advocates, who think that the whole ring is opaque, and that the apparent opening is due to the darker shading of that portion of it. If a star could be seen shining through the dark space between the outer and inner ring, the problem would be solved. But no twinkler has thus far made its appearance between the bright boundaries of the golden circlets, and furnishes the indisputable evidence required. The nearest approach to the much desired solution was made in 1707–8, when a star was seen between the rings and the body of the planet, and when Dawes, called the eagle-eyed, saw a small star pass behind the outer edge of the outer ring.

The ball of the planet presents similar phenomena to those observed in Jupiter. There are belts and spots and rifts indicating great disturbances, and the same process of world-making. As, however, the planet is double the distance, the observation is more difficult, and on a smaller scale.

The present is the golden opportunity for a close study of the Saturnian system. Some of our best observers are improving every hour fitting for telescopic work, and tidings coming from the distant orb will quickly be proclaimed for astronomical tidbits are rare in these days, and the discoverer is sure of immortal fame. The Saturnian moon, Mimas would afford a favorable standpoint for observation. It is the innermost of the eight satellites, makes its revolution round the planet in less than 23 hours, and is only 32,000 miles from the edge of the outer ring. A spectator on Mimas would behold the whole system of rings and the planet softly cradled with them, a vision of such sublimity and magnificence that finite fancy is powerless to paint its transcendent loveliness.

Rapid Progress in Electric Science.—The Philadelphia *Ledger* makes the following note of progress in the application of electricity. "Only twelve years ago Professor Tyndall gave his course of memorable lectures in Horticultural Hall. He had with him as a part of his apparatus an arc light. The lamp was regulated by clock-work, and cost probably ten times as much as the lamp made to-day. It was imperfect in every way, the light being very unsteady, and several times got out of order at critical moments. The current was supplied from a voltaic battery, at a cost that precluded its use for any but lecturing purposes. The battery, besides being costly and troublesome, required the constant work of an attendant for a day or two to 'set up,' and it also was very apt to get out of order. Dynamo machines were not unknown at that time, but they too were costly, and for lecturing purposes the battery was considered best. Looking at the display of lamps in the exhibition, and the variety and number of dynamo machines, it seems almost incredible that it is only twelve years since such a man as Professor Tyndall was well pleased, rather than otherwise, to be able to exhibit his poorly regulated clock-work lamp, run by some hundreds of cells in a voltaic battery."

Pure Chlorophyl.—J. Borodin describes, in the journal of the Royal Microscopical Society, what he believes to be the long-sought pure chlorophyl. He obtains it in a crystalline form, by slow evaporation of an alcoholic solution, though he has not yet been able to isolate the crystals. They are doubly refractive, giving a beautiful green sheen in polarized light. Their physical properties differ from those of the dark-green crystals of hypochlorine hitherto obtained.

Eggs packed in well-dried ashes, and so as not to touch each other, it is said, have been kept perfectly sweet for twelve months.

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SAN FRANCISCO:
Saturday Morning, April 25, 1885.

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☞ *See Advertising Columns.*

Passing Events

The ordering of a new trial in the famoue Alhion-Richmond mining case is an interesting piece of news for many persons, more especially in view of the opinion of the court concerning the method hy which the former judgment was obtained.

The general newe from hase metal camps is not highly encouraging, as the prices of lead and copper continue so low that some properties which are running are doing so at a loss. The shutting down of the Horn Silver Works in Utah has a depressing effect on the lead industry in that region.

Trinity, Siskiyou and Shasta counties in this State continue to attract more miners than other sections, and many men have already gone to those regions.

The foreign news received during the week is of a tenor to lead to the expectation that war will be declared hefore long hetween England and Russia. As Uncle Sam etands ready to sell provisione and material, the impreeeion prevails that a war abroad will lead to a revival of husiness here for a time at least.

THE Eureka Con. mine is looking and producing well. In fact, the mine is said hy those knowing ite condition to be looking better today than at any time in a year past.

Near Bridgeport.

Record Progress.

It has been too much the custom in the past for experts in mining matters to preserve secrecy in the matter of improvements in mining and metallurgy. Of late, however, a change in thie respect is apparent. Such associations as the American Institute of Mining Engineers have done much to hring ahout this needed change, and various individuals have given to the world the results of experience in special hranches. The publication of "papers" by the memhers of said societies has hrought out discussions in wbich the opiuions and experience of others have been made public, to the general bcn fit of all in the profession.

This change of policy can not be other than heneficial. Men who are thoroughly posted in any special department or branch of mining or metallurgy need not fear too great rivalry because they make public their experience. They hecome more widely known than hefore aud establish their reputatione on a wider hasis. People desiring to make inquiry in these epecialties are directed to them hy those who have rean the publications, so that, instead of losing husiness opportunities, they are more apt to gain them.

As a general proposition any enterprisee of an extended character are not apt to be conducted without men of experience in the different branches. Those persons who have shown themselves to be specially posted in their respective hranches and are known by their writings, are more apt to be called upon to fill positions than men who have kept their knowledge to themselves, and have not identified themselves publicly with these specialties. The exchange of opinions upon interesting subjects must be conducive to individual and public knowledge. The progressive nature of modern industries is sucb that constant improvement is heing made, aud few hranches remain long in the same stage. Each man can learn eomething from another. The best posted individual may learn something of value from practical men engaged in the same pursuits.

And it is not only the case that people write more for the transactions of societies, hut also for the technical journals than formerly; and people who do this hecome well known for their special knowledge, which redounds to their advantage in the end. The editors of the PRESS are alwaye glad to receive communications on subjects of special or general interest, and the readers are always glad to poruse them. Let us hear from you, gentlemen, as often ae you find time to write.

New Mexico Mines.

Owing to the fact that stage travel in New Mexico is slow and often only semi-occasionally, the letters of our representative, Mr. Frank W. Smith, who is doing the eouthern mining districts for the PRESS, come to hand slowly. Elsewhere in this issue will he found a description of Black Hawk, Grant county, New Mexico. This will he followed hy the other districts of that county, also one in Sierra and Socorro counties. The investigations of the PRESS representative show a renewal of activity in New Mexico's mines. New and frequent strikes are numerous in old as well as newly discovered districts. Miners and mining men of the West, especially Californians, will read these letters with interest. San Francisco capitalists are gaining a strong foothold in New Mexico's hest districts. Western men are welcomed hy the people of the Territory, and they are looked to for the future development of the rich mines of this advancing and progressive Territory.

We have of late heen receiving large accessions to our mail list iu Arizona and New Mexico, both of which territories are growing in population and commercial importance. The mining industry in these regions is but in its infancy, for until of late years both Territories have been isolated and offered emall attraction for settlere. The railroads have changed all that and the Territoriee are heing eettled up hy people who have gone there to stay and make their homes. New mines are conetantly being found and opened.

New namee are heing added to the liet of eubscribere of the MINING AND SCIENTIFIC PRESS from other quarters as well. We shall put forth our best efforts, and with our carefully earned reputation iu conducting a mining publication, we expect to improve the paper greetly the coming season, and receive large accessions to our mail list. The PRESS is the only illustrated paper on this coast wbich is devoted to mining and metallurgical matters, and the 25 years' experience of its publishers enables them to puhlish a paper which is of interest and value to its special class of readers.

An Important Improvement in Electrical Appliances.

At the last meeting of the California Academy of Sciences quite a display of electrical apparatus was placed upon the tahles, and a large audience assembled to hear a description of a new system of telegraphy.

The suhject matter was introduced hy the president, Prof. Davidson, statiug that having witucssed the first private exhihition of the new system of telegraphy invented hy Mr. John C. Ludwig, he hegged Messrs. Garnett and Heuston to delay their visit to the East in order to present the apparatus to the inspection of the members of the academy, and to illustrate the connections and relations of the different parts of the apparatus he agreed to make a series of large drawinge. The gentlemen had finally yielded to show this invention to this Academy hefore placing it hefore any other scientific hody.

The president said it seemed to him a etep so far in advance of any taken in recent years that he doubted whether it was not a revolution in telegraphy. In the tests and experimeuts at the first exhihit be had withdrawn the zinc from the hichromate potash until only the lower edge of the zinc, not exceeding a square balf-inch was touching the surface of the fluid, and the generation of tbe electrieity and the transmission of signals were perfect. The sounder at the end of 105,000 ohms (over 5,000 miles) was sharply and instantaneously responsive to the break of the transmitting key, and that when one or more psrsons were placed in the line the same results were ohtained. Moreover, it mattered uothing whether tho line was fine or coarse, and this was a very important element in the capital invested in laud lines and ocean cahles. In the former the thickness may he very greatly reduced; in the latter a coarse, strong wire, or more than oue, may readily replace the delicate seven copper-threaded cables. On cahle work he was satisfied that the sounder could he used as well as on land lines, and that the Thompson instruments and their high royalties would be done away with. He believed that this new departure was only the heginning of much morc extended discoveries which would embrace light and power, and he had lately witnessed experiments in another line which seemed to he only another application of the principles involved. It seemed difficult to understand how the terms current, discharge, etc., could apply in the present case without a special designation of their meaning.

He said that General Heuston would read a short and euccinct paper upon the suhject; that the president would follow in an explanation of the drawings (which we very much enlarged over the eignal sketches), and that the instrument would he then operated and be open to the inspection of the members aud their friends.

General John Heuston then stated that the invention which he wished to bring to the notice of the academy related to an improvement in the art of producing *induced* electric currents for telegraphic and other purposes.

The special object of the invention is to provide strong and highly efficient electric currents for telegraphy, etc., while ohviating the maintenance of large and continuously expensive voltaic batteries and ponderous power-driven mechanical geuerators.

The induced currents produced by this invention are different from those produced hy ordinary induction coils as heretofore used iu telegraphy. They approach morc nearly in character the currents from magnets or dynamo-electric machines, but the mode of tbeir production is very different from that practiced with such machines, in that there ie in it required no movement of any part of the generator—the simple making and breaking of a circuit of a emall battery hy means of an ordinary tranemitting key serving to magnetize and demagnetize an electric magnet, which by its alternations of conditions effects, iu suitable adjaceut coils surrounding magnetic cores, the iuduction of powerful currents, which traveree the line-wire alternately in opposite directions, and actuate relays or other receiving instruments constructed for operation hy such reversed currents.

The generator essentially consists of two permanent magnets of the horse-shoe form, arranged flatwise with relation to each other, and at a suitahle distance apart, one being above the other in the instrument hefore you. Between the permanent magnets near their curved ends stands a hlock of wood or other isolating material serving to keep them separated a proper distance. Each pole of hoth permanent magnets is provided with a projecting soft-iron-pole-piece, the pole-pieces of one magnet extending toward those of the other, and separated therefrom a suitahle distance. Each pole-piecc is surrounded hy a coil of insulated fine wire. The coils of each magnet are connected in a pair hy their inner terminals, and the two pairs are connected together between two similar outer terminals. By this arrangement induced currents simultaneously produced in all the coils hy the north and south pole-pieces, are caused to flow in the same direction. The outer extremities of the other two coils are to he connected to the earth and the line respectively.

The permanent megnets have their poles of oppoeite character arranged opposite each other—that is, the tip of the north pole piece of each magnet faces and is adjacent to the tip of the south pole piece of the other magnet, and in the space between each opposed pair of tips, and also in a limited contiguous space is comprised an intense magretic field. If a piece of soft iron or a magnot were moved through this field athwart and hetween the opposed polar tips, currents would he induced in the coils; hut with a view to obviating the neoessity of moving an amateur with relation to the pole-picces, tbe poles of an electro-magnet have been permanently arranged between the pole-pieces of the permanent magnets, hut eeparated from them by thin interspersed plates of isolating material. This eletro-magnet has coils of large wire, so that its cores will he promptly and efficiently magnetized when said coils are traversed hy an electric currrent. The alternate magnetization and demagnetization of the cores of the electro-magnet affects in an increased degree the purpose which would be accomplished hy moving an armature through or alternately into and out of the magnectic field. In other words the intermittent magnetization of the electro-magnet or hetter still, reversing its magnetic polarity by curreuts alternately in opposite directions through its coils, results in the induction of very powerful currents alternately in opposite directions in the coils of fine wire which surround the pole pieces of the permanent magnets the strength of such currents depeuding on the strengh of the permanent magnets and the size of the wire. A single small-sized hichromats of potassium cell is sufficient battery for all ordinary purposes, and will produce a proper magnetization to induce a current sufficient to overcome a resistance of over 100,000 ohms, whic is the resistance of over 5,000 miles of No. 1 galvanized iron wiro, such as is commonly use in practical telegraphy.

Of course it is understood that in using th reversed currents produced by this generat for telegraphing hy the Morse code a suitab receiving instrument must he used, and such have the pleasure of showing you. This instrument differs from ordinary polarized relays i that there is utilized hut one pole of a perm nent magnet which communicates a simil polarity to the two cores of an electro-magne and in front of these two coree is pivoted a hs anced soft-iron neutral armature, the opposi ends of which are attracted with equal forcs l the two cores when no current traverses the coils. Wheu, however, an instantaneous cu rent traverses the coils in one direction, one the cores will be strengthened and the oth weakened in its attractive power. The etrong will then attract the adjacent end of the arm ture toward it, throwing out the other e against a stop which may he utilized either a sounding-stop or a circuit-closing contact of local circuit. The armature heing thus attract will remain under the control of the attracti core by reaeon of being cloee to it, and unti reverse current ie eent through the coils. Th the operation will be revereed, and the otl core will have the overpowering attraction. will thus be eeeu that although the effect of t

onrrents themselves is hut momentary, they may be utilized for producing movement of ths armature at intervals correepnnding to the dots and dashes of the Morse cods.

After this the inetruments were nperated; the line was broken by five of the membere put in the middle nf the resistance coile.

Tho current was moderately eharp to the track of tho broken ende of tho wires. The battery was less than a half-pint cell for ths main line, and the eame for each local receiver and sounder. Tho key for making alternate pnsitive and uegative connections is quite ingenius, and ie attached to the rear end of the generator which was in a box ahout six iuchee long and four deep and four broad.

Many of the membere afterward examiued the instruments and questioned Mesers. Heuston and Garrett concerning them.

Aaron's Assaying.

Mr. C. H. Aaron, tho well-known metallurgiet (author of "Testing and Working Silver Ores," "Leaching Gold and Silver Ores," and another work on "Assaying"), hae iesued this week parts two aud three of the latter, as a separate pnblication. Part firet wae entirely devoted to gold and silver ores. Parts second and third (in nne volume) refer to gold and silver bullion, lead, copper, tin, mercury, zinc, nickel and cohalt; and there is also an appendix to parts first and third.

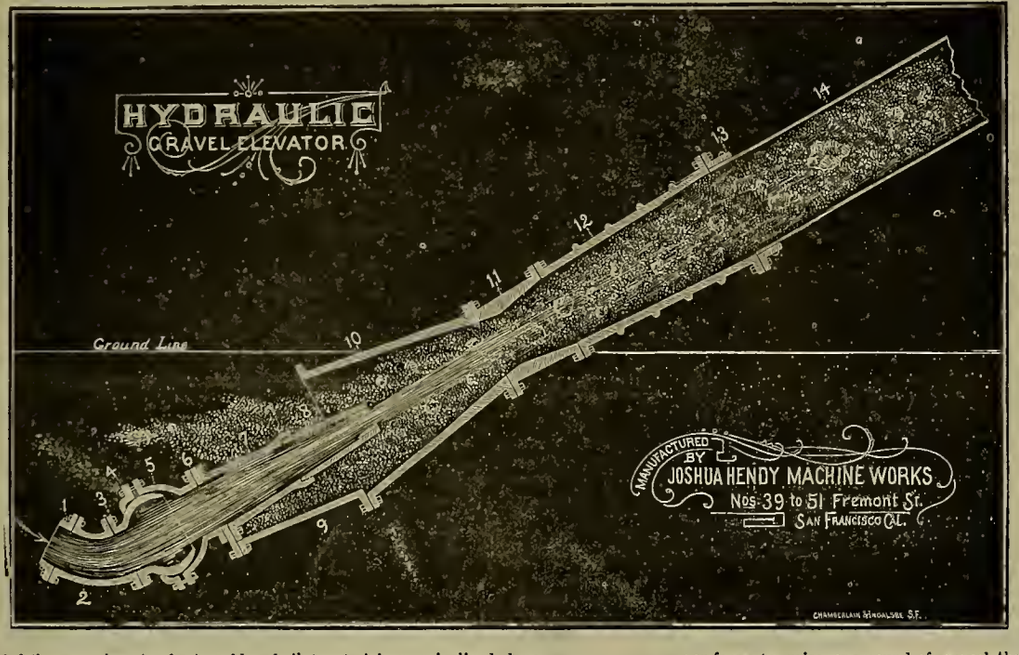
The work, which is puhlished hy Dewey & Co., of the MINING AND SCIENTIFIC PRESS, 252 Market et., comprises eome 160 pages. It is designed not eo much for the use of students who enjoy the advantages of professional instruction, as for that of people who want to assay—whether for husiness or pleasure. The methods and processee are described in plain language, free from chemical formulæ, in a manner to he readily comprehended, which is, by the way, one of the secrets of the success of Mr. Aaron's former works. His descriptione are clear and plain, and there is no mietaking any directions, which, when followed strictly, lead to proper results. The hook will be found of great aid in learning. The price ie eufficiently low to enahle any one interested in such mining or metallurgy to purchase it. The hook is compact and might have been extended to much greater dimenoions —after the manner of many scientific publications—without increasing its ueefulness. It was considered heet to keep it of a convenient size for ready use hy workers.

SOME three or four years ago, when Lewis District was at the zenith of its prosperity, a railroad was huilt from the Nevada Central across the valley and up the canyon to the village. When the camp went dowu the road was abandoned and at one time was considered worthless, except for old iron. Now, a reaction has eet in and Lewie hide fair to he more proeperoue than ever before. The old railroad is heing repaired, and arrangements are heing made to run tri-weekly traine over it to accommodate the freight and passenger trade of Lewis. —*Silver State.*

Hydraulic Gravel Elevators.

We present herewith an illuetration of a "Hydraulic Gravel Elevator," which, in its practical operation, may, in a measure, assist in eolving the great problem of hydraulic miniug, and by the adoption and use nf which the cost of driviug expeneive hedrock tunuele will be dispensed with, tho question of the deposite nf debris be disposed of and new fields nf enterprise hs opened iu the development of the many shallow deposits of auriferoue gravel existing in the mining districts of the world.

The principle upon which the operation of theso hydraulic gravel elevators ie hased is the simple fact, which is well nnderstood hy hydraulic miuers, that water, earth, gravel or any other heavy material can be driven up an incline, ascending plane or hill by the hydraulic force or a volume of water acting under a head or pressure. In a flume it is only necessary to give the impelling water more velocity to cause it to carry more earth or gravel before it. To accomplish this the flume is given a greater descending grade, and it is, therefore, only necessary to give a volume of water more velocity than it hae through an ordinary flume to make it acquire sufficient force to impel before it earth, sand, gravel or any other heavy material up an incliued plane.



This fact euggested the construction of a form of machine which should so confine and direct the inherent hydraulic force of a etream of water acting under preesure, as to move hefore its reeistlees power massee of earth, gravel or other material, and the cut herewith presented illustrates the featuree of the machine devised for the accomplishment of that purpose, and to which the attention of those of our patrons controlling shallow placers is espeoially requested. Their construction consists of an iron pipe having a horizontal ground eection entrance, and throat and auxiliary pipe leading therefrom and upward at an angle of 45° to an ordinary open flume lying ahove and extending heyond the pit or excavation made in the course of the conduot of the mining operations, and into which the water and material impslled through the conduit pipe ie discharged.

This horizontal section is constructed with an open end back of or hehind the entrance and throat of the pipe, into which the hydraulic nozzle is fixed and directed. The open end of this ground section is concave in ehape, or a lower half-eection of the pipe flaring outward, and into whioh the earth, sand, gravel, etc., are sluiced or washed hy emall hydraulic giants, through hedrock flumes leading thereto, the elevator entrance and throat eections heing eet in a pit excavated helow the hedrock surface.

The material sluiced into this entrance is taken up hy the stream issuing from the fixed hydraulic nozzle, which, by its impinging force, impels it forward and upward through the pipe to its point of discharge into the open flume ahove, whence it ie carried away through a line of sluice boxes to a final dump.

Confined as the material is within this tight iron pipe, it is necessarily impelled forward with ths velocity of the stream itself, and as each particle of gravel or other material is directly acted upon by ths full forcs of the stream discharged through the hydraulic nozzle, it is conoiderahly disintegrated hy thie action, as well as hy the friction along tho pips in its ascsnt, and the pulverization is so complete that long and expensive outer flumes or lines of sluice hoxes are rendered necessery.

The impinging and frictional action of the water, earth, gravel, etc., creates the greatest amount of wear upon ths ground entrance and throat eections and at the point of upward curvation of tho pipe, and the maximum amount of such wear is necessarily upon tho under sections; consequently, these sections and the curved portion of the pipe are constructed in half-sections—an upper and lower, with flanges turned out on each side, so that the eeveral sections can be bolted together, and the lower sections becoming worn can be replaced with little trouble and at small coet.

These machines are made of any capacity and will handle any head of water ordinarily used in hydraulic mining.

In the operation of theee hydraulic gravel elevators the primary ohject is, of courss, to have them perform all of the work of which they are capable, and as it requirss no more power to raise one pound of water, the mining operations ehould be so conducted as to endeavor to pips as much earth, gravel, etc., toward and into the entrance ae is possible, as they can eeldom he overloaded.

It is important to bear in mind that it costs as much time and money to raise water through the elevator pipe as it doee earth or gravel, and it requires an equal amount of power or force to raise the one as the other.

The practical operation of these machines has demonetrated the fact that when properly and advantageously set and operated the amount of water and material which can be raieed and impelled through the ascending pipe is governed and limited only hy the volumne of water used, acting under its given head or pressure, and its consequent capacity, force or power to carry the same through the outer discharge flume toward the dump.

It is estimated that a volume of water, under a pressure of 100 feet (vertical) will raiee material 10 feet high; and ae high pressure is more effective than low preseure, 200 feet will raise 20 feet high hetter than 100 will raise only 10 feet, 200 feet will raise say 22 feet, and 300 feet eay 40 feet.

The above data are simply the theoretical impressions of the effective force of certain volumes of water acting under given heads or pressures, hut the actual prectical operations of these hydranlic gravel elevators have demonetrated a far greater effective force.

We are informed that at the property of the Yreka Creek Gold Mining Company, in Siekiyou county, California, a No. 3, 18-inch elevator of the improved form was placed in poeition and operated during a period of nearly three years, and it was there determined that a volume of 650 miner's inches of water operating under a preesure of 266 feet was efficient to eupply two hydraulic giants for hank washing and bedrock sluicing, and as well to supply the elevator and ite accessory water-lifter with all necessary water for their proper operation in raising all ssapags or hedrock water and all earth, saud, gravel, etc., continuously piped to it, to a hight of 47 feet, and could have elevated the same to a hight of over 50 feet with equal facility, aud that at no time during ths conduct of operations was the machine overloaded, and the wear of ite eeveral parts was inconsiderable.

These elevators are menufactured under Letter's patent, hy the Joshua Hendy Machine Works, Nos. 39 to 51 Fremont street, this city, and we are assured that they will be pleased to furnieh such information as they may poseee relative to the construction, operation and practical results to be derived from their adoption and use, thie subject having been made a epecialty hy the managers of these works.

Mine Pointers.

The lighting of coal mines hy electricity has not made any practical progress as yet even in Europe, and many great difficulties will have to be surmounted hefore it will he accomplished.

The Danish system of horing deep holee with hollow rods down which water is forced, and so hringing up the debrie to the surface outside the rods, is said to heve accomplished very rapid work in deep holes.

Mine managers should be careful not to huy steel ropes for hoisting which are very low priced. They should eet their faces against the practice of reducing cost and eo deteriorating the quality of such important articles as hoisting-ropes. Nothing ahout a mine is so important as this, and only the very hest material should he ueed.

In this country too little atteution is paid to having good plans of mines; accurate surveye, accurately put on paper, with a system of contour plans say every ten feet properly plotted. Such records are very useful, not only for carrying on works, but serve as records which may he of service in future explorations. Some few of our large mines pursue this plan, hut the system is hy no means general.

Steady work on a productive mine with plenty of ore will pay hetter in the long run than a rich strike of a emell hunch of ore. Yet, too many miners are looking for the emall, rich hunches. The mines that have paid hest in this State are not those with specimen rock, or those which have showed ore worth $1,000 a ton. The hest paying mines are those which have paid a small profit on each ton, by turning out a good many tons. Prospectors ehould remember this fact.

Of all the mistakes made in mining mattere none have led to more disaetrous results than that of spending large sums on surface improvements hefore actual underground development warranted it. Milling or milling plante, working machinery, wagon roade, tramways, etc., are of course necessary to hig mines, hut it hy no meane is the first necessity for them. There are more instances of wrecks of mining property from heavy surface improvements than from undergrou ad expenditures.

The plan of leasing mines is developing many good onee. Work progressee in many mines that would otherwise he idle, by this system, and men are given employment that pleases them. People in this country prefer to work for themselves where possihle, and thie system is producing very good results wherever in vogue. A few years ago very little mining was done in this country on this plan.

EDWARD ROBERTS made an extensive tour of Alaeka, and in an interview after his return, spoke enthusiastically of its mineral resources. He eays its mineral wealth is beyond computation. Gold of the finest quality exists in unlimited quantities in quartz of the mountains in various sections. The only question remaining to be solved ie its accessibility. Douglass Island, 100 milee NE. of Sitka, ie in the center of mining operations at present. It is owned by San Francisco capitalists, and a 120-stamp mill, the largeet in the world, is in operation. Labor is cheap, and there is no reason, aside from the distance and difficulty of getting at the gold quartz, why Alaska should not supply a large percentage of gold mined in America in the future.—*Sonoma Democrat.*

Sierra County, N. M.

(*Continued from page 266.*)

were paid for was extracted from them, in some instances in ten days. Pay from grass-roots has been the rule rather than the exception about the camp. In no camp on the Pacific Coast has less dead work been done than in this. Every property that has been worked so far has been worked at a profit. The Iron King probably is an exception in this case, as the company has erected a smelter at great cost and a failure of the existence of sufficient lead ores in their own mines, and not being able to secure any quantity from neighboring mines, on account of the little activity in development, the plant has not proved a paying investment.

"Dandy" Prospects.

With but few exceptions the best mines of the camp are owned by individuals. A number of these mines were not only self-supporting but self-purchasing as well. The Black Colt owned by Wilson Brothers and others was bonded for four months, the price being $6,000. The first week's work more than paid for the mine. Several cars of ore that run over 400 ounces per ton have been shipped from the mine.

The Illinois, one of the most extensively developed properties, is owned by Eastern and California men and is systematically managed by Col. A. W. Harris, an old-time Californian. This property demonstrates almost a certainty of the permanency of the mineral bodies. Depth and development has uncovered numerous bodies of high and low grade ores, principally the former. If a continuation of affairs be had at a few hundred feet deeper there will be less of a lottery about the existence of ore bodies and a strong probability of a fissure vein.

The Superior is owned by a stock company, San Francisco people holding the most of the stock. J. B. Hagin, ex-Gov. Perkins, George Hearst and the widow of the late Col. Logan, of San Francisco, being the principal owners. The death of Col. Logan by a recent stage accident proved a sad blow to the interest of the camp as well as a stoppage of the extensive development of the property. The mine has produced considerable rich ore; it is situated on the main mineral belt in the midst of rich and paying mines. No information is given of its workings or stoppages, and if any discoveries are made that would be of benefit to the district it is religiously kept from the public.

Tailings.

The smelter will blow in during this month.

Freights on ore to the railroad at Lake valley is $6 per ton.

The mines of the North Percha, north of Kingston are free milling gold ores and they promise to be opened up quite extensively this season.

The Bullion was bought for $3,500. Some of the ore run as high as $ 25,000 per ton. The Monaska group, on the South Percha, owned by golden Colorado people, have suspended work on account of the death of F. E. Everett, one of the owners.

The one-half interest in the Lady Franklin mine was bonded for four months by the present owners for $6,000. One week's output was sufficient to pay for the interest.

The North Percha district wants a stamp-mill.

Practical milling men could not find a better field for investigation than Kingston.

The Brush Heap mine is one of the wonders of the camp.

Judge Burns and his associats, "Col." Barnaby (the latter of Mark Twain fame), handle a great deal of mining property. Col. B. owns a valuable property adjoining the Lady Franklin.

The Raff Brothers and C. C. Collins are pushing developments on the Lingo, just south of Kingston.

Wm. Harris, a rising young mining and civil engineer, has done some excellent work in the district.

Wilms & Kleiner are developing the Enterprise.

Wagon roads to mines, a sampling works that will buy ores and with more get-up-and-git instead of building castles in the air, will make Kingston a large and prosperous camp.

A concentrator recently erected at Kingston fails to work successfully; the cause is laid to the mismanagement. Another effort will be made to run on this summer.

The Smelter of the Iron King Company is a fine plant. Superintendent Wolf is an old Leadville smelter and his work is a credit to himself, and if he was supplied with ores would be most profitable to the owners.

The hotels are on the European plan, and like the camp the lodging houses are high-grade.

There are no poor mine owners in Kingston, although any number of them are short of means to push development.

A Western practical mining man will not have to investigate this district but a few days to find any number of excellent opportunities to profitably invest his money.

Would-be mining papers and Eastern newspaper "town-hoomers" have gulled both the town and mines of this district.

Sierra county properly belongs on the Pacific Slope, and she is looking to California capital and mining men to develop her resources.

Pueblo, Colo., gets most of the ores of this district for treatment.

There are four assayers in the camp.

F. W. S.

Tantalite and Columbite in the Black Hills.

The following was read by William R. Blake, of New Haven, Conn., before the American Institute of Mining Engineers:

In September I contributed an article upon columbite in the Black Hills of Dakota to the *American Journal of Science*. I had not at that time seen the paper by Professor Charles A. Schaeffer, of Cornell University, upon the occurrence of tantalite in the same region, or I would have gladly made reference to it. His analysis, proving the entire absence of columbic acid, shows that the specimen he analyzed at least should be called tantalite, and not columbite, if the distinction between these two closely related species is to be maintained. It is hard to say where the line is to be drawn in such cases between two minerals, when the specific characters and the composition are so nearly the same. If the name is to be determined by the relative amounts of tantalic and columbic acids, what shall we call the mineral when these acids are present in nearly equal quantities? Preference was given in this case to the name columbite, for the reason that the specific gravity, as ascertained by the ordinary scales at command, was nearer 6 than 7. As Professor Schaeffer had only one fragment by post, while I had an abundance from many places, it may yet be found that columbic acid predominates in some of the specimens. I therefore use the name columbite or tantalite indifferently. With this explanation I proceed to give a few observations upon the occurrence of the mineral with the tin ore of the Black Hills.

There are two localities, especially, where the mineral is found in the same dike or vein as the cassiterite: 1, at the Etta mine; 2, at the Boh Ingersoll claim. At the Etta it occurs in close association with albite and feld-spar in crystals from one to four or five inches broad, and from one-quarter of an inch to three inches thick. It is not in contact with or mingled with the cassiterite, and each can be separately taken out. It is easily distinguished from tin-stone by its color and dark streak or powder, which is very different from the streak of cassiterite. It has never been mistaken for tin ore by any one connected with the Etta development, and the fragment sent by mail to Professor Schaeffer by the superintendent of the mine was not supposed to be tin ore. It is rarely found in the greisen rock with the tin ore, but a few small crystals have been seen near the outer margin of one of the irregular masses of the latter. It does not replace the tin ore, or interfere with its abundance to any appreciable extent, and it has not been looked upon as an impurity to be avoided. Even if it were present to a considerable amount it would not injure the tin in smelting. It does not alloy with tin, but carries a small percentage of tin which would probably be liberated in smelting. These remarks are rendered important and necessary by the fact that the announcement of the discovery of tantalite has been in some quarters abroad considered as showing that a mistake had been made respecting the occurrence of tin-stone, and that the supposed tin-stone had proved to be merely tantalite.

I found at the Ingersoll claim a very remarkable mass of columbite or tantalite, which must weigh over two thousand pounds. It is the only body of the mineral seen in that part of the vein, and is not in close association with the cassiterite. One charge of giant powder broke it into several fragments, three or four of which were each too heavy for a man to lift. The mineral is found also in a greisen-like aggregation of mica, which at this locality is not tin-bearing.

It has not yet been found in the tin ore veins of the Hill City district, except, perhaps, in one instance, and then not in contact with tin ore.

MONTANA COPPER COMPANY.—The smelter belonging to this company is running in full blast on ores from their own mines. The furnaces are all running the same as usual, and the regular force of men are still employed turning out copper-silver mat. At the mines work is being continued on the same old drifts. The company's Parrot mine keeps up its old reputation by producing the usual quantity of ore of exceptionally good quality.—*Butte Miner.*

ANGEL'S district is now the leading mining section of Calaveras county.

Mariposa's Gold Bonanza.

We learn since the departure of Colonel Holcombe, says the *Mariposa Gazette*, that a new feature in mining has commenced in the Diltz Gold Bonanza. The winter's wash upon the outcroppings has exposed a large body of rich ore and put new life in this mine. A new shaft has been started on the south end on the lode passing through the rich ore body to connect with the 300-foot tunnel. The ledge on the surface at this point is some 30 feet thick. It is believed that this new shaft will develop and expose to view the richest deposit of gold quartz ever found in the county. It has been ascertained by assay that the decomposed streak of red ochre and auriferous matter which lies on the foot wall, and on the west side for 1,700 feet in length, varying in width from two to ten feet, will pay by proper milling process from $5 to $100 per ton. Colonel Holcombe considers this remarkable streak of decomposed ore one of the best milling propositions in Mariposa county, as the entire deposit will mill free gold from $20 to $50 per ton, carrying also from two and a half to five per cent sulphurets. This new discovery is independent of the "mother lode," which is of itself from 2½ to 30 feet wide, and without assorting quite a number of tons was ground at the old Whitlock mill, which yielded from $20 to $40 a ton. The Diltz Bonanza is opened up for hand mortar by three inclined shafts, averaging one hundred feet in depth, and an open cut through the ledge from the south to the north end, a distance of 1,000 feet, and at a depth on the ledge from 10 to 15 feet. Although it was at an early period of mining, it is well remembered by many who still live and can testify to the fact that the original discoverers of this ledge and the gulches in the immediate vicinity picked up, pounded up in mortars and ground in arastras a sum, believed to be under estimated, exceeding $100,000.

A bit of history which perhaps was never written up or published, for at that early period, in 1850 and '51, there was no such thing as a newspaper published here, but there are still living in this neighborhood men who remember Sherlock, a miner, who first camped on the Agua Fria, in 1850. He was a great hunter, as well as a prospector for gold. He first found the famous gulch which occupies a portion of the Diltz Bonanza on the northerly end, and it was supposed at the time that Sherlock took out of that gulch, which bears his name to this day, not less than $100,000. Under the pretense of hunting, Sherlock, without even a companion, was sole proprietor of the gulch for several months before he was found out.

As soon as Sherlock's still-hunt became known the miners flocked in and every foot of the gulch was taken up, and soon made to yield its countless thousands of beautiful coarse gold. Sherlock did not remain long after he was discovered, hnt, with as much as a "mule could carry" of pure gold, as it was instanced in those days, he rolled out with his fortune to the United States, where he originally came from. Underneath the Diltz mining claim is what is well known as the "Loomis Gulch," from which it is well known hundreds of thousands of dollars worth of gold was taken, and in richness was only second to the Sherlock. The Diltz Bonanza is situated on an elevation overlooking both of these famous gulches, which no doubt were supplied by the nature of things from this mine.

These were the days, and for ten and fifteen years afterward, the rich gulches and placer diggings yielded up their enormous wealth; but now they are completly exhausted and all that is left to commemorate their existance is perhaps, according to geology and mineralogy, what was the Father, or, as they are called, the "Mother Lodes" of gold-bearing quartz veins that thread the mining sections which in their normal state abounded with rich gold-bearing placers and gulches. To any extent quartz mining is the only description of gold mining now prosecuted in Mariposa county.

Connected with the Diltz mining property is a mill site at Sherlock's Falls, 1,300 feet from the new shaft which has a water fall or pressure of 400 feet. Also a flowing spring on the north end of the mine and two other water rights that can be connected with the mine for steam purposes have been surveyed.

A new road is completed around the entire property and connects with the main wagon road leading to Mariposa, over which all machinery and supplies are transported for the Sherlock and Whitlock mining district.

The property is owned by Captain John S. Diltz who has secured it by a U. S. Patent. He has been working the mine on a limited scale for years, most of the time the work being of such a nature he has worked alone. He is a great worker, and has had almost a life-time experience at mining, and has been able to do the work of two or three ordinary men. Now that he has his title perfected to all his mining property and his plans for future operations upon the mine, he hopes soon to make some permanent arrangement to build a mill and carry on the work upon a more extensive scale, or to effect a sale of the entire property to a mining company.

The Shroeder Mine.

This remarkable mine, which can claim for itself as being a good hydraulic claim, is also possessed of a large body of quartz rock, which, as the dirt disappears under the force of the hydraulic, shows a large fine vein of auriferous quartz. We learn through Captain Diltz, who visited the mine this week, that it never looked so well and promising as it does at present. The water supply is limited. The Captain says he likes the appearance of the quartz rock better than any he has ever before seen in that mine.

Prospects at Calico.

The *Calico Print* says: The mining interests and other industrial pursuits of Calico and neighboring districts are at present in a most healthy condition. Although Calico is not externally quite so lively as it was a few months ago, yet the business done by established firms is good and constantly increasing. The hundreds of miners that had flocked into the camp to get the benefit of a "boom" have scattered to the four points of the compass in search of and to assist in booming some other locality. The number of chloriders in the camp has increased lately, but when the hot weather sets in chloriding will be generally suspended until fall. The principal mines in the camp are doing well, as will be seen by our weekly bullion reports taken from Wells, Fargo & Co.'s books, which, however, does not give the entire bullion output, for the ore from the Sue mine, milled at Waterman's, and the ore purchased from chloriders by the Daggett Ore Sampling Company and other parties, is not included, but enough is given to show that this region is productive of silver-bearing ore in considerable quantities. All the milling facilities are engaged to their utmost capacity, and undoubtedly in less than a year their capacity will be doubled, employing at least 100 stamps. Taking this great Mojave mineral-bearing district in its entirety, averaging its advantages and disadvantages, resources and deficiences, there cannot be found a better field for the investment of the millions of surplus capital rusting in the banks or tied up in small paying enterprises, than it offers. Railroads have made transportation comparatively cheap and the indefatigable prospector and pioneer has smoothed the way to such an extent that all the capitalist has to do is to take a palace car and soon he will be in the midst of mining properties that will pay him a handsome dividend when properly developed. A glorious future is in store for this region and each year will chronicle improvements at a compound ratio when compared with its predecessor.

Unskilled Assayers.

The Black Hills miners are getting wild on account of discoveries of tin ore. But there is really reason to believe that there is the largest deposit of tin ore in the bills of any place in the known world. There is very little gold, except in the immediate vicinity of Central City, about three miles above Deadwood, and nearly all of that is low grade. To the knowledge of the *Statesman* deep prospect holes were sunk on the banks of Bear creek, between seven and eight years ago. To look upon, the specimens were magnificent. They resembled the richest of silver ore, but no responsible assayist would give any return from them. The same phenomena existed on Little Rapid, in the vicinity of Ross's bar, and at Bear Butte. As a result, the mines were abandoned. Finally, some skilled assayers tried the ors for tin, and the result has been to give a new impetus to mining, with a promise of the most flattering results. In Colorado tellurium lay upon the dumps for years, and no one knew what to make of it; no ordinary process could be used to procure a color from it. A scientific Englishman happened along one day and amazed the miners by informing them that it was the richest gold ore in the world, and so it proved to be. The history of the discovery of diamonds in Brazil was similar. All these things go to show that the degree of knowledge possessed by the ordinary assayer is not of a sufficiently high standard. This class of men have been doing immense injury to miners through ignorance. Such ignorance in this case has set the Black Hills country seven years behind. They should not be allowed to pursue their profession unless examined and licensed the same as attorneys and physicians. For years in assaying for silver in the Black Hills, they have burned up—completely sublimated the tin. It is very evident that a higher grade of scientific knowledge should be required of the average assayer, and that it should be made a subject of legislative action.—*Boise Statesman.*

A DEADWOOD miner, skeptical as to the ability and honesty of the assayers in that camp, recently played on those gentlemen the old trick, with the usual results. He pulverized an old jug, mixed it with graphite, and took it to a Deadwood assayer. Another portion he gave to a Lead City assayer. The Deadwood authority reported 30 ounces of silver per ton as the result of his assay, and the Lead City expert gave $2 per ton in gold and no silver as the result of his investigations.

SMELTING and freight charges have been reduced by the Pueblo Smelting Company. Their rates from Kingman are now down to $17, to $23 for freight and treatment, according to the amount of lead in the ores.—*Mohave* (Arizona) *Miner.*

Engineering Notes.

United States Engineers Aiding British Enterprise.

The English correspondent of the *American Manufacturer* says: "It was Dr. Tweddle (who is utilizing his United States experience in laying a system of pipes in the Caucasus, in connection with the oil wells there), in conjunction with an English pipe firm who are making most of the pipes for the Caucasus, who showed the British Government by experiments at Aldershot that with United States engines water could be pumped at Suakim, a distance of which before British engineers had little idea.

The Great Power of the United States Engines

Has taken the British pump firms aback. So considerable is the duty required of the pumps which the Government has instructed Dr. Tweddle to get from Messrs. Worthington, that, according to some engineers, there is no probability whatever of such pumps being in stock here, and a leading pump-making firm (Messrs. Tangye) declare that "many months would be required to make them." A firm in Wolvertown, however—Joseph Evans & Sons—are bold to assert that their firm could have supplied the pumps in 30 days at a cost of £2,000, instead of the £4,000 charged by Messrs. Worthington.

The United States Pump to be Copied.

With United States pumps and English pipes, the first 50 miles of the line, the Government conclude, can be worked. The remainder of the distance is to be worked by pumps upon the United States model. In the House of Commons, recently, Mr. Brand, on behalf of the War Office, said: "Having got the pattern it is the intention of the War Office to employ English manufacturers in future."

United States Pumps and Future Demand.

If the design of these pumps is not secured by patent in Europe the example of the British Government will undoubtedly be followed over a wide area. Attention which this business has directed to United States engineering capabilities must sensibly strengthen the respect for them, which it is now almost "the thing" to openly acknowledge in European circles.

American Engineering Enterprise—Bold Words from a Prominent English Engineer.—Mr. Arthur Rigg read a paper on this subject at the last meeting of the Society of Engineers, based on his observations during a visit to Canada and the United States last autumn. We find room for the substance of the final paragraph of Mr. Rigg's paper, which will be read with high appreciation by American engineers. "The idea of putting up everything cheaply not only saps the foundations of permanent success, but depreciates the quality of manufactured articles, and destroys honest dealing. Thus, some of our goods are being driven out of foreign markets and replaced by the more honest American productions. The writer considers it the most genuine patriotism to tell his countrymen the truth without disguise, believing that we can never lead the van of progress if we shut our eyes to what goes on in the world around. America is the best country for us to copy from, as it is inhabited by our own people; and there is more for an engineer to learn there than from any other place in the world. They welcome every new invention, and the man of genius can hope for an early reward to his labor; while the engineer can freely obey the sound maxims—make first sure of those general principles you intend to apply, then trust them implicitly; and finally, never be afraid to carry them out."—*Engineering.*

A Pneumatic Tube Between London and Paris.—The plan to connect Paris and London with pneumatic tubes has been reported favorably by the French engineers and submitted to the Government. It is proposed that two pneumatic tubes be laid, following the line of the Northern Railroad from Paris to Calais, thence across the channel to Dover, following the line of the South-eastern Railroad to London. Letters could be thus transmitted between the two capitals in one hour. Wagonettes like those now used to transport telegrams from Paris are to be used, weighing 10 kg. and capable of carrying 5 kg. weight of mail matter. Twenty pneumatic trains are to be started every hour. The total cost is estimated to be $7,000,000. The total distance is 475 km.

Tapping Goose Lake.—A company has been organized for the purpose of constructing a canal to tap Goose lake and conduct its waters into Pitt river, thence over the sage brush lands in that valley to irrigate the vast body of lands that are lying waste in that region. It is expected to make 60,000 acres of desert land productive and fertile.

Reversing Locomotive Engines.—English practical science demonstrates that reversing an engine on a railroad train has scarcely a perceptible effect in checking it; the main reliance must be upon the brakes. In one case, where the engine was reversed a quarter of a mile from the station, the train passed the station at the rate of 20 miles an hour.

Useful Information.

Nickel Kitchen Utensils.—It is well known that acids have a more or less decided solvent action on nickel-plating; and inasmuch as the use of nickel-plated kitchen utensils are becoming quite common, it is a matter of importance to determine what would be the effect on the human organism of the nickel which may find its way into the food prepared in such vessels. An investigation, having this purpose in view, has recently been made by F. Geerkens, who affirms that as much as ½ gramme (about 7½ grains) of nickel may be taken into the stomach and repeated for a long time without producing any noticeably bad effects. As the quantity of nickel which by any probable means could find its way into food in the course of its preparation in nickel vessels, would be only a fractional part of this quantity, there would seem to be no grounds for uneasiness in the use of nickeled kitchen utensils, especially where the same precautions are used as in the case of copper utensils—thoroughly cleansing, and avoiding the storing of food in them.

Paper Counterpanes and Pillow Shams.—A company in New Jersey is making paper counterpanes and pillow-shams. Number one manilla paper is used, two large sheets being held together by small twine at intervals of three or four inches, gummed so as to stick the sheets together where the twine lies. The twine strengthens the paper. The margin of the counterpane has a hem, in which is more of the twine to keep it from tearing. Beautiful designs are printed on the upper surface of the counterpane and pillow-shams, which make a very neat appearance. When they become wrinkled they can be made smooth by hot flatirons. They retail at seventy-five cents a set. The counterpane can be left on the bed when it is occupied, if so desired, and in cold weather it will be found a very neat and warm article of bed clothing, since the paper will prevent the escape of heat about as well as a woolen blanket.

What an Educated Man Ought to Know.—According to Ruskin, an educated man ought to know these things: First, where he is—that is to say, what sort of a world he has got into, how large it is, what kind of creatures live in it, and how, what is it made of, and what may be made of it? Secondly, where is he going—that is to say, what chance or reports are there of any other world beside this, and what seems to be the nature of that other world? Thirdly, what he had best do in the circumstances—that is to say, what kind of faculties he possesses, what are the present state and wants of mankind, what is his place in society, and what are the readiest means in his power of attaining happiness and diffusing it? The man who knows these things, and who has his will so subdued in the learning of them that he is willing to do what he knows he ought, is an educated man; and the man who knows them not is uneducated, though he could talk all the tongues of Babel.

Tinning Small Articles.—Dissolve as much zinc scraps in muriatic acid as it will take up, let it settle, then decant the clear, and it is ready for use. Next prepare a suitable iron vessel, set it over the fire, put your tin therein, and melt it, and put as much mutton or beef tallow as will cover the tin about one-fourth inch thick. This prevents the oxidation of the metal; but be very careful that the tallow does not catch fire. The iron, or any other metal to be tinned, must be well cleaned, either with scraping, filing, polishing with sand, or immersed in diluted vitriol. Proceed to wet the articles in the zinc solution, then carefully immerse them in the tallow and melted tin; in a very short time they will become perfectly tinned, when they may be taken out.

To Measure the Candle Power of a Light.—Measurement of the candle power of a light is accomplished by comparing the shadow cast by a rod in the light of a standard candle with the shadow cast by the light to be tested. By moving the latter toward or away from the rod a point will be reached at which the shadow cast by both lights will be of the same intensity. The intensities of the two lights are directly proportional to the squares of their distances from the shadows, *i. e.*, suppose the light to be tested is three times the distance of the candle, its illuminating power is nine times as great.

Artificial Sponge, made of cotton, rendered absorbent, and treated with antiseptics, has been invented in England, at Birmingham. A piece of the size of a walnut has absorbed water until it reached the size of a cocoanut. It is so cheap that it need not be used but once, so that sponge infection can be readily avoided.

Fat from Cork.—Suberine, the characteristic component of cork, is a true fat, saponifiable by alkalies and oxidizable by nitric acid, which converts it into a mixture of aulheric acid and ceric acid. It is composed of the mixed glycerides of phellonic and stearic acids.

Pine Wool.—True pine or forest wool—the "Wald wolle" of Germany—according to Mr. Thomas Greenish, is manufactured from needle-like leaves of one or more species of pine previously exhausted of the volatile oil and other matters by a process of boiling.

Useful Cement.—The following cement is said to be perfectly efficacious. It is so simple that it is worth trying: Take some old, soft cheese and heat it well in a mortar, washing it thoroughly at the same time with hot water. After the soluble matter is all washed away, a white mass of nearly pure caseine will remain. This should be squeezed in a cloth to express moisture, dried, reduced to powder, and preserved in a closely stoppered bottle. When required for use, a small quantity should be ground with a very little water, to make a thick, viscid paste, which must be used at once, as it hardens very quickly. Mix only as much as may be needed, for after it once hardens it will not dissolve. It is not affected by heat or water.

Use Glue Hot.—The hotter the glue is when applied, the greater will be its binding power in holding surfaces together; therefore, in all large and long joints glue should be applied at once after boiling. Glue loses much of its strength by frequently re-melting, and that which is freshly made is preferable to that which is re-boiled. In melting ordinary glue in the double vessel containing water, it is an excellent plan to add salt to the water in the outer vessel. It will not boil then until heated considerably above its ordinary boiling point; in consequence, the heat is retained longer, and when the water boils the glue will be found to be evenly and thoroughly melted.

A New Use for the Sand-blast.—Monuments and statues cast from refined zinc are given a sparkling appearance by directing a sand-blast under steam pressure upon them, so that the sand cuts the surface but does not adhere to it. A thin film of oxide is thus formed which stands atmospheric exposure admirably; yet the film is so thin that it scarcely admits of the nicest measurement.

A New Alloy.—*La Nature* gives the formula of a new alloy, which is especially adapted to many important uses in the arts. It melts at the low temperature of 160° Fahrenheit, or considerably below that at which the magical spoons of long ago melted in a cup of tea. Its composition is: bismuth, 48; cadmium, 13; lead, 19; tin, 20. The alloy will withstand severe pressure.

Alder Bark Tannin.—Alder bark contains tannin in quantity variously estimated at from 3 to 20 per cent. Lamasse says that this tannin is a methyl-tannin, and belongs to the same series as that of the oak. With ferrous acetate it gives a reddish blue precipitate; with ferrous sulphate an olive green. It is precipitated with solution of gum, but is not affected by tartar emetic.

Sandpapering Machines are among the greatest labor-saving machines which can be introduced into a wood-working shop, especially when furniture, brackets, etc., are manufactured. This will save from 3 to 10 men's work, and do it in a manner far superior to the way it is ordinarily done by hand sandpapering.

Filtered Water.—Water filtered through porous, unglazed porcelain is absolutely free from microbia. With a single such vessel, 0.20 meter long by 0.25 meter in diameter, C. Chamberland obtained about 20 liters a day of physiologically pure water.

A Mercurial Varnish.—A varnish composed of 120 parts of mercury, 10 parts tin, 20 parts green vitriol, 120 parts water, and 15 parts hydrochloric acid of 1.2 specific gravity, furnishes a good coating for iron exposed to the wet.

White Spots on Furniture.—To remove white spots from varnished furniture try this: Rub with a sandpaper gently; then with a soft piece of cotton cloth rub on some shellac varnish thinned with turpentine.

Foreigners in Paris.—The foreign population of Paris is comparatively very small for a great city. Out of a population of 2,239,000, all but 225,000 are native born.

Good Health.

Health in Workshops.

J. B. Lakeman, an English inspector under the Factory Act, recently lectured on this subject, in the course of which he said: To enumerate the various trades which were injurious to health, if unaided by proper ventilation, would include metallic-dust producing, mineral-dust producing, vegetable-dust producing and animal-dust producing occupations. Needle-makers, grinders, file-makers and molders suffered in lungs to the extent of 50 per cent, flint-cutters to the extent of 80 per cent, grindstone-makers to the extent of 36 per cent, weavers 25 per cent (the fiber of cotton being most injurious), brush-makers to the extent of 49 per cent, hat-makers to the extent of 15 per cent (the dust from cheap hats being more injurious than that from the fine felt), and chimney-sweeps and coal-miners were not included in these rates of mortality.

Speaking of the want of ventilation and sanitation in factories, he said that in this category they should exclude textile mills, not generally, but particularly, as he could point out factories where these things were properly looked after. Coming to such trades as printers, book-binders, bakers, dyers, and artificial flower-makers, he mentioned that these industries, in many cases, were not conducted under proper lines of ventilation.

He referred to the great importance of pure air in keeping workers in health. The conditions of work in closely-confined, over-crowded, and ill-ventilated workshops were something unbearable, and the consequences were fatal to robust life. The law said that a factory should be in a cleanly state, free from effluvia arising from drains or otherwise, should not be over-crowded while work was carried on, so far as to be injurious to health, and should be ventilated in such a manner as to render harmless, as far as practicable, all the gases, dust, vapors, or impurities generated in manufacture.

Pure Water.—Absolutely pure water is not to be obtained in nature, but by distillation. Pure water has a more powerful effect on lead pipes than that we ordinarily use. This is very easily proved. Get a bottle, three parts full of distilled water from a druggist, and put into it some bright, clean shavings from a bar of lead. In another bottle of hard water place similar shavings. Leave both bottles uncorked, but where no dust can enter, for a few weeks, then shake and examine. The distilled water will be more or less turbid from lead, while the other will be hardly altered. Rain water acts on lead about the same as distilled water, and should never be stored in lead-lined cisterns, or cisterns with lead pipes.—*Herald of Health.*

As in the textile trades so in other trades, many employers of labor did their best to keep their workplaces in a healthy state, but there were thousands of handicrafts-men who had passed their lives in workshops, and become masters in a small way, occupying places most suitable to their means. This meant frequently that in a small room there would be half a dozen people at work, and in these cases unsanitation abounded. Old dwelling-houses were now often turned into workshops, with every room full of women working under a state of things that ought not to exist. In conclusion he implored employers to consider the terms on which they employed free labor, and whether it was free labor at all that condemned a people to a lingering death.

Cost of Sickness.—Statistics reveal a somewhat startling tale of the cost of illness to a nation, and of the loss of valuable time, opportunity and money which even a small modicum of ill health entails. Thus it is calculated that the ordinary sickness of England and Wales annually costs the country 20,000,000 weeks' work—that is, as much work as 20,000,000 of people in good health would accomplish in a week. Put in another way, this amount may be stated as equaling one-fortieth part of the work done yearly by the whole population between 16 and 65 years of age. If any arguments were required to show that good health means pecuniary gain, the above fact would afford such proof.

Old Women's Remedies.—A writer in the St. Louis *Medical Journal* advises young practitioners never to make fun of an old woman's remedy. He will not only give offence, but may miss a valuable aid in his practice. The writer adds: "In 1830, while practicing in Madison county, Ill., I was indueed, by the representations of an old woman, to make the trial, in dysentery and diarrhœa, of tablespoonful-doses of pure cider vinegar, with the addition of sufficient salt to be noticeable, and it acted so charmingly that I have never used anything else."

The Brain Renewed Six Times a Year.—The novel computation has been made by a German histologist that the human brain is composed of no less than 300,000,000 nerve cells, each an independent body, organism and microscopic brain so far as concerns its vital relations. As each nerve cell is estimated to live about 60 days, 5,000,000 must die every day, about 200,000 every hour, and nearly 3,500 every minute. The dying cells are replaced by an equal number of their progeny, and once in every 60 days a man's brain is entirely renewed.

How Germs Get into the Lungs.—In the ordinarily healthy lungs, perhaps even in persons who have a consumptive heredity, the germ which causes the breakdown of the lung may not be able to make an impression; but if the physical integrity is destroyed by poor food, or any debilitating influence, or by a cold, then the germ is able to get in its work, and to multiply and produce its kind and to fill the lungs with tubercles.—*Dr. Curtis.*

Cocoaine.—Cocoaine may be used with perfect safety for performing slight surgical operations, such as opening a boil or carbuncle, cutting or lancing the gums, for operations on the eye, etc. A boil may be cut after applying it on the surface with no more pain than is felt in cutting the finger nail. It is a very valuable discovery.

Wet Feet.—To live on a soil which keeps the feet damp and cold is a frequent cause of consumption and rheumatism. Good draining is the only remedy for such a soil. In three towns in England, Eli, Rugby and Salisbury, consumption has declined from 40 to 50 per cent since the land has been thoroughly drained.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SOUTH SPRING HILL.—Amador *Ledger*, April 18: The new double engine and hoisting works are now in successful operation. Notices have been posted calling for bids for sinking 100 feet deeper, with the intention of opening up another level. The mill is running steadily, and everything about the mine looks as encouraging as ever. The addition of ten more stamps to the mill is expected to be accomplished this summer, as the ore body in sight is considered sufficient to justify such increase.

MISCELLANEOUS.—The North California Mining Company have let another contract to run their tunnel 200 feet further. The price is $2.95 per foot—50 cents per foot below the last contract—contractors to furnish candles, powder and fuse. The tunnel is now in 400 feet, and it is expected that the ledge will be tapped before the next 200 feet is completed. The big tunnel at Middle Bar is now in over 2,200 feet. Fresh developments are reported at the St. Julian. A larger deposit of black gold-bearing metal than any recently encountered was struck early this week. The mill has been supplied with a new wheel, and also a double-car which doubles the crushing capacity of the stamp.

HARDENBURGH.—Amador *Sentinel*, April 14: J. R. Hardenburgh and ex-Sheriff Adams of San Francisco came up last week and took a look at the Hardenburgh mine. Mr. Hardenburgh states that in all probability work on the mine will be shortly commenced. Some work is being done upon the Moore mine property. Very good rock is now being taken from the old Dunning and Faull mine by the new prospectors.

Calaveras.

GOOD LUCK HYDRAULIC.—Calaveras *Chronicle*, April 16: Work in the Good Luck hydraulic at Chili Junction, owned by Hughes and Jones, is progressing favorably. The company has been to a great deal of expense, having had to dig a ditch three and a half miles long in order to convey water to their mine. The claim comprises 80 acres of good ground, and the bank ranges from five to forty feet in hight. The company is using 100 inches of water under a pressure of 75 feet. No clean-up has been made in the mine as yet, but there is not the least doubt but that the owners will reap a handsome reward for their trouble and expense.

MURPHYS.—The outlook for a prosperous summer is encouraging. In the Oro Plata shaft sunk to intercept the tunnel being run to tap the larger ore body of low-grade, free-milling ore, quartz of exceeding richness has been encountered, and bids fair to be extensive. The strike is important, and in consequence the company is elated. The mills will start up in about three weeks, when good results are expected. In time the entire works will be run up to their full capacity.

Inyo.

RUSS MINING DISTRICT—THE WHITE HILL.—Inyo *Register*, April 14: [This is we mine the last issue unwittingly designated as the "White Star,") Alexander, Kehoe & Barnes, of the White Hill mine, have about 30 tons of silver-lead ore ready for shipment; they will increase this amount some 10 or 12 tons this week. The ledge is looking strong, and gets larger as it is opened. Hedge & Eldred are working the Pine Tree mine, an extension of the above, and have a fair showing. There is no doubt but this will open out as large as the White Hill.

EASTER SUNDAY.—Pat Keyes has located the south-east extension of the White Hill, and calls it the Easter Sunday. The croppings indicate as good a mine as there is on the hill.

THE UNION.—Reynolds & Treglown are taking ore out of the old Union. They have about 20 tons ready for shipment, and which will probably go to San Francisco, since the boys are still awaiting pay for ores sold to the Elna furnace last October. [This is, or was, we believe, the first mine located in Russ district. This was in 1861, and by two different parties at the same time. They joined forces and hence called it the Union, and the district after the leader of one of the parties, Col. Russ. The district covers the western face of the Inyos, between Lone Pine and Independence.]

BROWN MONSTER.—Thomas & Bell are still taking out ore from this mine, and expect to have 20 tons ready for shipment by the 1st of May, which is as soon as the new Selby Works at Oakland will be ready for operations.

SANTA RITA.—It is reported that this mine bids fair to again, ere long, loom up as prominently as it did years ago. It is looking well.

MINING GOSSIP.—A private note from Independence states that Isaac Harris and Wm. Hedge had just returned from the Reilly mill, Argus range, where, in the interest of the firm of Harris & Rhine, they made a clean-up of the pans, and presumably, with very satisfactory results. Also, that L. C. Gray, who spent so many years on the Kearsarge mine, had, according to rumor, secured foreign capital, and would shortly be here to resume operations on the mine.

WAUCOBA.—Some months ago Fuller & Erwin took out a couple ot tons of ore from a new find over in Waucoba, and had it worked at the Elna furnace. It proved not only quite rich in silver, but also the best smelting ore ever tried in that furnace. They, or at least one of them, have been and are still driving away upon it ever since, and were their reduction works at hand, would undoubtedly make it pay first-rate. As it is, they can pack the ore across the mountain and make it pay very well.

MILL TALK.—It has been the talk for some time past that a small mill is to be built at Mammoth this summer. A few men have been digging away there ever since the grand exodus of three years ago, and at times have found considerable bodies of rich ore. This fact with the apparent assurance of more to be had right along, will, it is said, well justify the erection of a small mill, and it is quite probable it will be done. The big Mammoth mill yet stands there, but is a total wreck. It will be remembered that it was reported sold for removal to Bodie or thereabouts, but winter coming on, nothing was done in the way of its removal. It is considered nearly a certainty that a 10-stamp mill will soon be built to work the ores of the Casey and other mines across the river here. A recent survey shows that by means of a ditch from a neighboring creek, ample water-power can be had right at the mine. As the mine produces large quantities of ore that will pay cheap milling, saying nothing of other qualities of higher grade, no doubt but the mill will be built there. But, from what parties tell us, a mill at Bishop station could have the ore of a large number of good gold leads, many of them known to be rich, some small, others of fair size, and all quite close at hand, saying nothing of such as the Casey, Poleta and others, still within easy reach. We believe a mill at that point would do a good business. Arastras are running on ore from some of these mines, particularly in Redding canyon, and others are proposed. Four men are constantly employed on the Casey mine, and are taking out ore in paying quantities.

WHITE HILL.—Inyo *Independent*, April 18: County Clerk Hunter was up to the White Hill district last Wednesday. He says it is the best poor man's mine he has seen in many a day. There was then thirty-five tons of ore on the dump, and more being added every day. Like every one else Mr. Hunter regrets that such fine ore should have to be sent to San Francisco for smelting. The ruin of the furnace at Elna has left Owens Valley without any facility for smelting ore, and now that the supply of good ore appears to be better assured than ever before, the want of such facility is all the more keenly felt. Parties have lately tried to get the use of the furnace at Swansea, but there appears to be a bad case of dog in the manger there. From the Jim mine at Darwin, Gorman and McKenzie are taking out a good deal of fine ore; it goes 87 ounces per ton in silver, and 40 per cent lead. The same parties have recently bought the Champion mine, adjoining the Jim. The Maxim mill is about ready to be started up. Mr. Stansfield has several hundred tons of ore at the mill, and plenty more available; he has persevered in the face of many difficulties, and fully deserves a rich success.

Mariposa.

TO START UP.—Mariposa *Herald*, April 17: F. C. Leavitt goes to Cathey's Valley to-morrow to start up the Maggie Johnson mine and mill. He expects to thoroughly develop the property and will work all ore taken out. He also intends to do custom work at the mill when not crushing his own rock. There is another mine, the name of which we did not learn, that he intends to prospect. What the mining interests of Mariposa county need now is for a few mines to commence shipping bullion out of the county. That kind of argument convinces capitalists quicker than anything else of the value of a mining community. There are mines at work in the county that probably ship bullion regularly, but we have no means of ascertaining the amount in Mariposa. Work was recently commenced by some Fresno parties on the old Green Mountain Copper mine near the residence of Willis Brewer in Lewis district. Four men are at work driving a tunnel. Several gentlemen who were in town this week from the north side of the river report that the recent strike in the Red Cloud mine is a bonanza. The Banderite is also showing up to a good advantage. The specimens of gold that are constantly being brought into town from Sherlock's and Colorado would indicate that there are mines in that vicinity fabulously rich. The lucky owners seem to have no desire to sell and manage to keep their bullion shipments a secret.

Nevada.

NORTH STAR MINE.—Grass Valley *Union*, April 17: A force of 65 tributers are now at work in North Star mine, and the number is to be increased soon. About 100 tons of tribute rock have been raised to the surface since underground work has been resumed. Now that the water in the mine has been pumped out, the steam pump, which was used for lowering the water, will be replaced by a stationary pump. The mine does not make much water at the bottom, and the pump will not have heavy work to perform. The main incline is soon to be sunk for another level. The different levels, since the mine has been relieved of water, are found in general good condition.

A RICH MINE.—Nevada *Transcript*, April 17: The Delphi mine is situated about three miles from Columbia Hill, on what is known as Grizzly Hill. It is owned by R. McMurray, Judge Searls and others. Their new 8-stamp mill was completed about 10 days ago, and by good judges it is said to be a model affair, perfect in all its parts. Chris. Mallon and George Lord, of this city, have charge of running the mill night and day. Everything on the surface having been got in tip-top shape, work was continued on the ledge, and that ledge is proving to be one of the most valuable ever discovered in this county. The rich chute of rock they are now working is from 5 to 12 feet thick, and all of it will average $32 per ton in free gold, besides the sulphurets which will yield $100 per ton. They are now crushing about 18 tons per day, and out of this they are averaging a ton of sulphurets every 24 hours. Their expenses, all told, will not average over $40 per day, and thus it will be seen that it is not only a rich mine, but a very cheap one to work. The owners expect to have a clean profit of $10,000 for the first month's run, and the probabilities are very strong that it will exceed that amount. The mine is a new one, and one that has been passed by a thousand times, not being considered of any value. Nevada county contains a network of quartz ledges, and after the present generation has passed away it will yet be a booming mining camp, for we have ledges here, after the proper work has been done on them, to maintain 10 times the population our county now possesses. This new and valuable find should give a new impetus to the section where the Delphi is located, and will in a measure make up for the loss the people have suffered by the stoppage of hydraulic mining.

BELMONT CON.—*Mountain Messenger*, April 18: Belmont Con. Co., Poker Flat, have the frame up for their mill. A good trail has been put in for packing machinery to the mill. Seventy tons of rock are in the dump and 100 tons in sight, the gold from which is valued at $17.30 an ounce at the U. S. Mint. In two or three weeks the mill (Taylor & Forbes) will be started, when more ore will be taken out.

Placer.

SUCKER FLAT MINE.—*Argus*, April 16: The new management of the Sucker Flat mine are enlarging the tunnel, in order that they may be the better able to work the mine to advantage. They propose to employ three horses in hauling the cars instead of one, as at present. The enlargement is made by taking up the bottom of the tunnel. They are also making other improvements, among them being the building of a new dump-house. About 15 men are employed at the mine now, but it is expected that 40 or 50 will shortly be put on. The mine is reported to be paying handsomely.

Plumas.

CROMBERG NOTES.—Plumas *National*, April 18: The Ward mine is running with a full force, Gen. Evans as superintendent. Mr. Ward has gone below. Mr. Jackson is running along all right, working both mines, the one here and in Mohawk. The river is very low, and there will be several bars worked this season. Considerable mining will be done on the river this year.

San Bernardino.

WATERMAN MILL.—*Calico Print*, April 18: Col. Burch has just returned from Waterman, where he has had two carloads of ore milled. He reports the returns as more than satisfactory both as to weight and assays. The Waterman mill is earning for itself an excellent reputation among chloriders because of the fair and square returns that they receive from their ore crushed at the mill.

Shasta.

GOLD AND SILVER.—Shasta Co. *Democrat*, April 15: Last week from three tons of ore from the Florida mine Dan O'Neal cleaned up 40 ounces of gold. Last week ten tons of average ore from the Silver King were shipped to San Francisco for a working test. It is reported on good authority that the Iron Mountain mine will resume work and shipments this month. J. D. Doblin of Muletown has bonded his placer and quartz mine near that place to parties in San Francisco for $15,000. Some New River prospectors abandoned their proposed trip at this point and struck out for the new gold fields on Squaw creek. Mr. Jno. Southerland, superintendent of the Niagara Mill and Mining Company, was in town Saturday. He says the new 10-stamp mill is running well. From 15 to 20 miners are prospecting in the mountains near Muletown. We are told several good prospects were struck in that district last week. Further sinking in the Pioneer mine on Oregon gulch has been deferred for the present. The shaft is down 50 feet. At this depth the water is too much to handle with a common windlass. Dan O'Neal has purchased the interest of his partner, Abe Ebersol, held in the Ebersol and Red Seal quartz mines on Star gulch; also his interest in the cannon-ball mill, and will have it running in about ten days. Having entire control of the property now Dan is preparing to do better work on the mines than ever. Mr. Wm. York, of Vallejo, has bonded the Red Rock mine on Flat creek for one year. He will put a good force of men at work opening up the mine and expects to put up a mill early next fall. The Red Rock is a continuation of the May Queen and Black Jack. Both of these claims prospect well, carry fine "gouges" that pan out rich in free gold and the vein confined in fine walls of porphyry and slate. The sulphurets from these three claims assay from $150 to $250 per ton, of which the ore produces a good percentage. These claims are undoubtedly good property for any one having the means to properly work and develop them. Quite a number of prospectors have recently made locations on Dog creek, from 3 to 5 miles west of Delta, and are at work sinking shafts and running tunnels to open them. Sanders & Whitlow have about completed their concentrator, and we have every reason to believe it will prove a very profitable investment for them. The croppings from two or three of these claims assay several ounces in silver, as well as from $20 to $40 in gold. Mr. E. W. Stoufer, assayer, who was up there last week putting up the arastra for Sanders and Whitlow, speaks well of the camp, and thinks several good mines will in time be shown up on the creek.

Sierra.

PLACERS.—Cor Sierra county *Tribune*, April 17: Your correspondent has been busily hunting up items in relation to the mining industry of this vicinity (Sierra City), and has learned that the Lewis brothers are bard at work on their placer claim in Ladies canyon. Dan Thompson will commence operations on his placer claim this week. The wagon road leading to the Young America quartz mine will be completed in about two weeks, weather permitting. I learn that there have been negotiations going on either bond or sale for the Mountain mine; this mine is owned by Capt. H. Warner; he has a U. S. patent on his property. It is said to be one of the best locations in this district, there being a number of well-defined gold-bearing veins in the mine, varying from size to two feet in width. A large number of tons of rock has been worked by the arastra process and will pay from $12 to $14 per ton. The veins being large, great quantities can be mined at a very trifling expense. There is also a good water right attached to the property. There are quite a number of persons out on the hill prospecting quartz. It is said some are meeting with very flattering results. If the operations go on that are talked of in the different mines there will be quite an influx to our population this summer.

Tehama.

TO RESUME.—Shasta county *Democrat*, April 16: J. R. Holt, of Red Bluff, interested in the Kauffman placer mine on Mill creek in the north-eastern part of Tehama county, informs us that the company is preparing to resume operations on that mine this spring.

Trinity.

PAYING WELL:—Trinity *Journal*, April 18: The two Blakemore arastras on Eastman Gulch are being run by Messrs. Jas. H. Fisher and R. Killins, and the rock is paying well, the last clean-up being about $3,200—the rock averaging from $40 to $50 per ton. The rock crushed is from the Blakemore mine.

TRIAL TEST.—A delayed casting for C. W. Huson's new quartz-crusher was received this week and has gone forward to the North Star mine on East Fork. The mill will be started up to-day and next week it will be known how much work it can do and how well it can do it.

NEW QUARTZ DISCOVERIES.—New ledges are reported as found during the past week on Eastman Gulch, between the Hickey and Blakemore mines, and another on Spring Gulch, a tributary of Indian creek. Good prospects have been obtained in both instances.

W. F. ARNOLD, of French Gulch, was in town this week, and reports mines and mills of that flourishing district in active operation, doing good work and as a rule paying well.

DISTANCES.—The Eureka *Times-Telephone* gives the following table of distances from San Francisco to the New River mines by way of Eureka, with the assurance that it is as nearly correct as possible by the present traveled route: "San Francisco to Eureka, 240 miles; Eureka to Arcata wharf, 10 miles; Arcata wharf to North Fork, 10 miles; North Fork to Berry's, 15 miles; Berry's to Willow Creek, 20 miles; Willow Creek to Thomas's, 24 miles; Thomas's to New River, 30 miles." A little addition shows that the total distance from Eureka to the mines is 109 miles.

Tuolumne.

GOLD.—Tuolumne *Independent*: Capt. Griffin, of Columbia, has a very rich claim in his residence lot. The streak makes up from the old Tiger claim, crosses the road and runs under his house. He has taken out a large amount of gold, and it is estimated that he will take from $20,000 to $30,000 out of the claim. On Saturday he cleaned up about $900. In three pans of dirt he got $80, in one of them $27.75. Parties who have visited the claim say it is the richest thing they ever saw, as the gold can be picked out of the solid gravel bank. Mr. James Tulloch is adding 10 stamps to a fine 10-stamp mill, at Angels, Calaveras county, which he erected there about three months ago. He also has a contract to put up an 8-stamp mill at the same place. The quartz interest appears to be lively in that section. A few days since two young men of Sonora took out a $500-pocket near town. As they do not desire their names or the locality of their mine given, their wishes in this report are complied with. But there is no mistake about the gold, for it was exhibited to friends.

RICH GRAVEL IN COLUMBIA.—*Union Democrat*, April 16: Captain John Griffin has struck 49 gravel in a claim which he is piping in Columbia, and is taking out the yellow stuff at a surprising rate. All those who have seen the ground are agreed that the claim will produce many thousand dollars. As it is, the Captain is taking out $50 a day. The ground lies under an old road, and was left unexplored by the early miners. It prospects anywhere from $4 to $25 to the pan, mostly in fine gold. The extent and extraordinary richness of the ground is proof positive that Captain Griffin has a considerable bonanza in his claim.]

NEVADA.

Washoe District.

HALE AND NORCROSS—The good ore development of Thursday has inspired renewed confidence in the ultimate success of this company in showing a paying mine at the present profound depths attained. On the 2,900 level cross-cut No. 4 west, which was at first intended to run diagonally in a north-westerly direction across the vein, has been turned more to the westward, so as to cut directly across the vein. On the 3,000 level cross-cut No. 2 has been advanced west about 60 feet from the main lateral drift north, and the good ore which was struck at the floor of the cross-cut now occupies the whole face. The easterly pitch or dip of the vein is more perpendicular than on the level above, therefore it was not reached by this cross-cut quite as soon as expected. Moreover, it is not precisely known as yet whether this is really the main vein or an offshoot or bulge to the eastward. Yet, if the vein widens from the level above in going down, this may easily be the eastern selvage of it. Five or six feet of pretty good ore have been passed into, and some rich stringers and bunches of black sulphuret ore encountered, assaying up in the hundreds. Some vein porphyry as well as low-grade ore help to make up the composition of the vein, but the whole mass will probably average $50 per ton or more under the stamps. Meanwhile this cross-cut is being steadily advanced, and will develop the ore vein or bonanza possibilities and probabilities at that depth. Very little water has been encountered thus far, and owing to the nature of the ground no trouble is anticipated from that source. It is proposed to carry this cross-cut through to the west wall.

CON. CALIFORNIA AND VIRGINIA.—On the 1,750 level the south-west drift, being run toward the old Con. Virginia ground, continues making a good rate of advancement, and the ore stopes on this level are still looking and yielding as well as usual, keeping the Morgan mill steadily supplied. The ore gives an average assay of a little over $20 to the ton. The ore stopes between the 1,200 and the 1,500 levels are also turning out as well as usual, being worked under the Jones' lease. The ore gives an average assay of a little over $30 to the ton, and is reduced at the Eureka mill.

CHOLLAR.—On the 3,000 level cross-cut No. 1 west has been advanced to about 85 feet in toward the ore vein, from the main south lateral drift, and is running in quartz of the most favorable character, containing bunches and stringers of ore, indicating the near proximity of the desired vein. The face of this cross-cut is near to the Hale and Norcross line, and will eventually cross it unless turned more to the left.

BALTIMORE.—A small vein of good-paying ore, a foot or so in width, extending from the 200 level down to the 400, which has worked and followed more or less in years past, is now being systematically and successfully worked by tributers. This they store away in the drifts until they get a sufficient accumulation for hoisting to advantage and milling.

KENTUCK.—The old upper levels keep the Rock Point mill on Carson river steadily pounding away as usual.

BELCHER.—Nothing new in the mine beyond the extraction of low-grade ore from the old workings through the Crown Point.

OVERMAN.—The winze to connect the old Lambert tunnel with the Petaluma-street tunnel, has nearly reached down to the desired connection. When this is made the known ore resources of the

226 level will be advanced into and further developed.

ALTA.—Good work is done in the explorations above the 950 level after the occasional small bunches of good pay ore found there, which are being extracted and reserved for milling.

YELLOW JACKET.—The old upper levels continue their excellent yield of low-grade ore—from the 1,150 level up to the 200, or sagebrush level. Bunches of pretty good ore are found about the 400 level.

WOODVILLE.—Nothing new to note except a reported improvement in the stopes between the 300 and 400 levels.

GOULD AND CURRY.—On the 1,000 level the main lateral drift north toward the Savage has progressed about 350 feet from the shaft, and is making good advancement in favorable working material.

CROWN POINT.—The yield of low-grade ore from the old working levels, from the 1,700 up, still continues, with an occasional streak of better quality.

Columbus District.

MOUNT DIABLO.—*True Fissure*, April 18: The west drift on the sixth level has advanced 11 ft. during the week, while the north cross-cut from this drift is in 67 ft. The west drift on the fifth level shows a little $70 ore. The winze from this drift is down 35 feet, and shows a small streak of $30 ore. The stope above this drift is giving some $50 ore. The intermediate between the fourth and fifth levels and above this stope is giving considerable $70 ore. The intermediate between the same levels and near winze No. 2 is not looking quite so well. Some ore of fair grade is being taken from between the third and fourth levels near winze No. 5. Some $70 ore is being taken from the west drift on the third level. The east intermediate stope between the second and third levels shows a small streak of $200 ore. The west intermediate between same levels is giving some $50 ore. A small amount of fair-grade ore is being extracted from the east drift on the second level. The intermediates between the first and second levels are giving some ore of good grade. A bullion shipment of $14,475.27 was made on April 14th.

Cortez District.

PROSPEROUS.—*Eureka Sentinel*, April 17: From a miner just in from Cortez we learn that that camp is booming in a quiet way. He claims to have seen more bodies of high-grade ore on Bullion Hill than he ever saw in the same space of ground elsewhere in the State of Nevada. He says the reason he left was because all the country of value thereabouts is located, and that there is no show to get in any. It was the first camp he ever struck where the miners did not talk of selling out. The principal mine is that worked by Gillam Bros. and Tex. They are stoping down ore from a 5-foot body that our informant took samples from, the whole face of which, he claims, averages $1,500 a ton. The old pioneers of Cortez say it is the finest body of ore of such richness ever struck in the camp. It is a contact vein between granite and stratified lime. Billy Earls is working an adjoining claim, which is rapidly turning out ore averaging $800 a ton. It is another contact vein. Hank Smith has a 16-inch ledge in the Aurora mine at a depth of 250 feet. He has stripped it for a distance of 40 feet in length and 10 feet high, and he now has a winze started down from the tunnel level. The ore produced so far assays $1,450 a ton. These are the deepest workings on the hill. S. E. Ducommon, of the Silver Fleece, has ore in two places, which he is sacking for shipment to Salt Lake. W. R. Lewis has opened three bodies of fine looking ore in the Maid Queen. De Vere & Bowdoin are driving a tunnel along the ledge of the Sweepstake mine, and are extracting a fine quality of sulphurets and antimonial ore.

Taylor District.

LOOKING UP.—Cor. Southern Utah *Times*, April 14: As was predicted, nearly all the mines in Taylor are in full blast, and are turning out high-grade ore and plenty of it. Bullion shipments will be in order for some time to come. The Argus group of mines is looking splendidly, and the company undoubtedly will, at an early day, be more than compensated for the prospecting work they have done. The large bodies of ore the company have thus far uncovered is of a superior quality. Our two mills are hammering away and are turning out bullion at a lively rate. Over 100 men are working in the mines, and millmen, wood-choppers, teamsters and others are busy, and all branches of business are lively. Another correspondent says: "The mines are looking well and the outlook indicates that we will have a lively summer; but I think there has been too much puffing in the newspapers, as there are a great many men coming in here in search of work and are disappointed, as there is not employment for all; hence, there are many idle men here. Fifty-five men are now employed at the Argus and about the same number in the Monitor mine. Both mills are in operation down on the creek, and the probabilities are that they will pound out crude silver until winter freezes them up again.

Tuscurora District.

NORTH BELLE ISLE.—Tuscorora *Times-Review*, April 17: North drift, 150-foot level has been extended 11 feet; total distance, 152 feet.

INDEPENDENCE.—Drift south, 400-foot level, has been extended a total distance of 1,170 feet, and at this point an upraise will be started to connect with No. 1 shaft. No. 1 cross-cut from this drift has been extended 70 feet, No. 2 cross-cut 9½ feet, and cross-cut west 4 feet.

BELLE ISLE.—North drift from No. 1 cross-cut east, 400-foot level, has been advanced 5 feet. Fair progress has been made in drift north from west cross-cut, 250-foot level. No. 2 upraise north on the 250-foot level, has been carried up 5 feet, and shows some good ore.

NAVAJO.—Cross-cuts and drifts on the 650-foot level have been extended the past week 61 feet. No. 1 winze, 350-foot level, has been sunk a total distance of 196 feet. Fair progress has been made in the drift south and cross-cut east, 350-foot level. South drift, east vein, 150-foot level, extended 5 feet. No. 2 cross-cut east, same level, has been extended a total distance of 207 feet.

Willow Creek District.

THE WILD DEER MINE.—*Silver State*, April 18: H. H. McColley shipped yesterday a bar of bullion valued at $1,155 from the Wild Deer mine, at Willow Creek, to the Carson Mint. The Wild Deer is pretty thoroughly prospected by shafts and tunnels, and is said by old miners to be very valuable property.

ARIZONA.

MOHAVE MINES.—*Miner*, April 12: Messrs. Maxson and Jackman are working on the Primerosa mine in Todd Basin, and have a nice little pile of ore on the dump. This is one of the many good claims owned by Capt. Layne. James Smith is opening up the N. G. claim, an extension of the Gibraltar, near Layne's springs, and has developed a body of good ore. Rees M. Jones and James Daggett have leased the Queen Bee from C. E. Sherman and have sunk a 30-foot shaft. Messrs. Sample and Jamieson are working on the old Gibraltar claim and doing well as may be seen from the fact that a recent shipment of five tons netted them the nice little sum of $584. Henry P. Ewing showed us the returns of his last carload of ore from the Altata mine received last Friday. The ore was shipped to the Argo smelting works and sampled as follows, per ton: gold, 1-12 ounce silver 91½ ounces, copper 17½ per cent. Price paid per ton at the works, $88.67. Total for the carload $1,059.78. Price charged for treatment, $15 per ton. Freight from Kingman to Argo, $20.50 per ton.

STERLING.—Prescott *Courier*, April 10: Messrs. Cox & Craigue are now paying strict attention to the development of the Sterling mine, which is at present a very promising gold property. Their Hoefler mill will soon be at the Sterling.

BIG BUG.—A gentleman who came here from Big Bug district a couple of days ago tells us the mill was about ready to run. One hundred or more tons of gold-bearing quartz were on the dump. Professor Church will, we hear, start and run the mill for the owners. Lawler Bros. are drifting in one of their Santa Maria copper mines. The talk on the street is that Mr. E. M. Clark will soon be here from the East, with means to sink 100 feet more on the Chicago mine, Groom creek. Those who are working placer mines are rejoicing on account of the late rain, which assures them plenty of water for some time to come.

TURKEY CREEK.—Mr. Theodore L. Chase, superintendent of mills and mines in Turkey creek district, came to town yesterday after a long absence in the hills. He is feeling well, too, on account of the arrival of three concentrating machines, which, with one of his 10-stamp mills, will be taking the gold out of ore from the Wonder mine in a very short time. Mr. Chase came by Mulvenon & Roach's mine, and there feasted his eyes upon a great deal of rich silver ore. He gives it as his opinion that the time for profitable workings of our mines is at hand. J. L. Fisher yesterday received nearly $2,000 in gold from the Lynx creek hydraulic claims.

COLORADO.

PREPARATIONS.—San Miguel *Journal*, April 16: The weather continues in an unsettled condition, and there is apparently less real work going on in the mines than in the dead of winter. The fine, warm weather in March promised an early spring, and, had it continued, a number of mines would now be working full forces and shipping ore daily. Preparations for the resumption of active work were being made, but the storm of last week unsettled all plans, and at present but little can be done. A great many of the leading mines have been developing all winter, and the amount of ore that is exposed and that can be rapidly taken out is something wonderful. All the mills, too, are preparing for a busy season, and one or two new ones will pe erected.

IN MARSHALL BASIN.—Work has been resumed on the Leslie mill, and it is expected that it will be in running order early in the season. A force of men began work last week on the Argentine, taking out the water preparatory for an extensive working of the mine. It is expected that members of the company will be here next month to examine the mine and decide upon the character of machinery necessary for its profitable working. Work on the Sheridan, Flora, J. W., Jr., and on other properties goes steadily on with pleasing results.

BEAR CREEK.—This locality will be the scene of greater activity this year than ever before witnessed. The mines of the Golden Group Company will be in charge of a Mr. Thompson. The company have ample means at hand for a vigorous season's work, and it is their intention to thoroughly develop their properties. They have some very promising prospects, and we predict that they will be listed as paying mines before fall. Mr. E. L. Davis, superintendent of the Nellie Company, has leased the Golden Group mill for the season, and will begin active operations as soon as the trail to the Nellie is opened.

TURKEY CREEK.—At the Gold King mill preparations for starting the mill are all completed, and it was expected to start up this week. At the Turkey Creek mine a small force has been employed all winter in taking out ore. The force will soon be increased and the mill started up. O. D. Brumbaugh, who is working the Dixie under lease, has out a large lot of good ore. He has 300 sacks all ready for shipment. The Dixie is the mine of Turkey Creek.

GENERAL NOTES.—Charlie Byfield came down from the Magpie, on Bill creek, and reports the mine looking excellent. He is now working in 15 inches of solid mineral. In the lower level of the San Bernard mine, at Trout Lake, a large body of mineral was struck last week. Mr. Gamboni, the owner, is considerably elated over the new strike.

IDAHO.

BONANZA.—Cor. Idaho *Keystone*, April 11: It is too early in the season to give you any items of importance in regard to our new mines, but there are several locations on which developments have been going forward all through the past winter, that bid fair to become rich ore-producing mines. On Horse Hill, just west of Bonanza, Mr. Wm. Shehan is working three mines, the Legington, Roanoke and Afterthought. He has well-defined veins of ore which prospect well. The Dorchester on the same hill, owned and being worked by Mr. McNamara, is on a line with the Charles Dickens and Montana mines, and is supposed to be on the same vein. There has been no ore crushed from these mines, but there probably will be this summer. The new vein that was discovered in the Custer mine some time ago, which lies between the Pfeiffer and Tonkin's tunnels, is about seventeen feet wide, and grows wider and stronger as work progresses; and under the skillful management of those having the mine and mill in charge, the bullion produced this year will exceed anything heretofore recorded of this famous property. The Custer Co. have leased the Badger mine, and will, when the proper time arrives, put a force of men to work taking out the ore, which is known to be rich. There is considerable ore already on the dump.

ATLANTIC.—Idaho *Statesman*, April 17: Mr. O. J. Fleck, of Atlanta, called on us yesterday. He reports four feet of snow on the mountain between Atlanta and Rocky Bar. All the mills in Atlanta are shut down, the last one to shut down was Mr. Petill's, the Atlanta mill, about four weeks ago. Times, of course, are very dull now and will not revive until supplies can be got in, which will be six weeks or more. The stage has not got into Rocky Bar, but goes within six miles and the rest of the way on horseback.

A 30-STAMP MILL FOR CROY GULCH.—Wood River *Times*, April 17: Col. Doniphan, of the Big Camas mine, arrived to-day. He states that the mill will be shipped from Denver next Saturday, and will be taken out to the mine as soon as it arrives. The mill is of 10 stamps, but the building and engine will be of sufficient capacity for 30 stamps. The additional 20 stamps will be put on as soon as the mill demonstrates that the ledge will "pay."

THE GOLD BELT.—As stated in this paper, there will be at least two mills erected at or near the Rock and Camp creek divide this summer—one by Col. Doniphan's company, and another by that in which Senator Jones and a San Francisco millionaire are interested. These mills will simply test the productiveness and value of the ledge, and if the result is satisfactory, the Rock creek country will boom. Gold mines have always been preferred to all others, because the metal is easily extracted, and the ore veins more regular and cheaper to work than all others. Nor do people look for as rich ore in gold-bearing veins as in others. Sam Jones, superintendent of the Crown Point mine, and brother of Senator Jones, is expected here within a week to look the gold belt over. If his report is favorable, much capital will find its way here in the next 12 months.

THE CAMAS NO. 2 MILL.—Wood River *Times*, April 17: The machinery of the mill contracted for, last fall, for the Camas No. 2 mine, at the head of Rock and Camp creeks, has been completed for some time in Denver, and held to await advices from Hailey concerning the condition of the roads between this place and the mine; but it will be all shipped from Denver by the 15th inst., so as to reach here in time to be taken out to the mine by the 1st of May. Some of the machinery has already arrived at the Hailey depot, but the bulk of it will come as above stated. This will be a gold mill, of 20 stamps, with all the latest improvements, and will cost, when ready to start, about $10,000. The foundry work weighs over 40,000 pounds, and the Iron Works of Hailey and Denver have taken the contract to build the whole mill, which is to be finished by the 1st of June. The building of this mill will undoubtedly be the cause of the opening up of the enormous gold-bearing Big Camas vein.

NEWS.—George W. Faylor arrived to-day with his family from California. While in San Francisco Mr. Faylor succeeded in organizing a company, of which ex-Congressman Davis and United States Senator Jones are members, to exploit a group of mines at Rock creek.

MONTANA.

STEMPLE DISTRICT.—Helena *Independent*, April 14th: We have the pleasure of announcing the important developments that have occurred within the past few days, besides being able to furnish matters of interest concerning some of the old bonanzas in the Stemple district, about two and a-half miles from Marysville. Rich strikes have been made upon the Empire, Homestake and "M. L." lodes, owned by Hickey and Cotter, James M. Ryan, Mike Lane and M. Lynch. On the east end of the Empire lode a tunnel 100 feet in length has been run. At the end of the tunnel a cross-cut has been run, and a solid mass of gold and silver bearing ore has been struck of a width of 22 feet from wall to wall. The ore assays from $80 to $700 per ton, and from 28 to 32 ounces in silver. Four hundred feet west of the tunnel is a shaft 40 feet deep, at the bottom of which is run a drift and then a cross-cut in which 10 feet of ore has been struck, averaging from $80 to $100 per ton in gold and 28 ounces in silver. Eight hundred feet still further west is a 65-foot shaft in which a 32-foot drift has been run with a cross-cut at the end showing a 10-foot body of ore which runs from $100 to $150 in gold, and from 23 to 30 ounces in silver. On the "M. L.," a 400-foot fraction, a shaft 80 feet deep has been sunk and cross-cuts run. The west cross-cut shows an ore body of ten feet, the lowest average assay being $80 in gold and 35 ounces in silver. On the Homestake lode there are three openings about 200 feet apart, and each shows that the ledge is from eight to twelve feet wide. Although no great amount of development has been made, the ore shows well. The old Whippoorwill mill, owned by Hickey & Cotter, is undergoing repairs, and baving settlers and pans put in, and in about six weeks will be in good running order and prepared to work the ores of the above lodes.

THE HELENA DISTRICT.—From a gentleman who yesterday visited this new district we were given items as follows: The Helena's lode shaft is now down 82 feet, and shows three feet of solid ore, richer than ever, has been found in the claim. The Dies Faustus lode, owned by J. P. Porter, Thomas Goff and others, has a 30-foot shaft, and the ore in the bottom is about two and a-half feet wide and looks well. Secretary Tooker has a number of men at work on the Blue Jacket and is greatly encouraged over his prospects. The Syndicate, Christmas Gift and Grass Valley lodes are all looking well.

NEW MEXICO.

ORGAN.—Rio Grande *Republican*, April 18: Ross and Bennett delivered nearly three tons of galena ore carrying about $200 to the ton. It came from Silver Gem. The smelter closed down on Wednesday morning, and it is doubtful if it ever fires up again until they commence operations in Las Cruces. It throws a good many men out of employment. Mr. J. Sandon is putting in a small concentrator at the Bennett mine for the purpose of working the dump, and after he finishes that dump, he will move to others and go from one to another through the camp. We sincerely hope he will make a success of it. Should he do so it would be a great help and would help the miners here to dispose of their low-grade ores to a good advantage.

OLD MAN.—Silver City *Enterprise*, April 17: A strike of great importance was made on the Old Man mine on Tuesday. Five feet of high-grade ore was uncovered that is actually lousy with horn silver. Over 100 sacks of ore was taken out in a very short time that would have paid the running expenses of the mine some time. Two other strikes have been made at other points during the week, and the mine is said to present a better showing of high-grade ore than at any time for months.

GEORGETOWN.—The most important strike ever made in the Georgetown mines was encountered in the workings of the McGregor mine last week. A body of remarkably rich chloride ore, 28 feet in width, was uncovered by men who were drifting for an air outlet in the mine. After being thoroughly prospected Alex. McGregor took two samples from the face of the ore body. One of these, which he considered the best, returned $668 in silver, and the other, which was the poorest, returned a value of $368 per ton. The owners are very jubilant over the discovery.

OREGON.

RYE VALLEY PLACERS.—Bedrock *Democrat*, April 16: The Rye Valley Placer Company, located at Rye Valley, Baker county, Or., have started in work on their vast tract of placer ground this spring on a very extensive scale and with the finest prospects of a rich return for their energy displayed. For those of our readers who are not aware of whom compose this company, we give the following list of officers: Isaac B. Rich, president; H. E. Chamberlin, vice-president; John W. Drew, secretary and treasurer. Directors—Isaac B. Rich, Boston, Mass.; H. E. Chamberlin and Edward A. Jenks, Concord, N. H.; John W. Drew, General Manager. The capital stock of the company is $125,000, which has all been paidin. The company owns about 700 acres of mineral land, and nearly 400 acres of timber land, making nearly 1,100 acres in all. Also 20 miles of ditches, 10 reservoirs, etc. The company is entirely free of debt, is in complete running order, now employing 22 men, and running over 400 inches of water with five claims working full ten hours each. Rye Valley is about 100 miles from this city, and besides the very extensive claims of the Rye Valley company, other properties are being worked with great success. This section is one of the richest in our county, in placers, and of late some very valuable quartz discoveries have been made that promise of considerable value in the near future.

BURNT RIVER GOLD MINES.—Baker City *Tribune*, April 17: The excitement and interest taken in the great gold belt along Burnt river, in this county, between Weatherby's station and Huntington, is rapidly increasing, very much owing to the push and energy of the Union Pacific railroad system. Already one claim, which promises to be a valuable mine, has been sold the past week for a very large consideration. The claim sold is an extension of the Grover Cleveland mine, which, from all accounts, is a veritable bonanza. The Cleveland mine is owned by Dr. E. P. Howard, R. S. Anderson and others, and is said to have 1,000 tons of free milling gold ore in sight, which averages $80 to the ton. Railroad men and Eastern capitalists are already engaged in looking after this rich mineral belt, and we candidly expect to hear of large sales being made there in the near future. Experts from the East have already examined some of this great mineral belt.

UTAH.

HORN SILVER.—Southern Utah *Times*, April 14: The winze running from the 800 to the 900 has been completed. A station is being cut out at the bottom of the shaft, which is now finished to a depth of 900 ft. The air is so bad, on account of the shutting off of the draft by the cave in the old workings, that it will be impossible to work any number of men to advantage before the proper connections are made. It is safe to say that there will be no ore shipped from the mine for several months. During the first part of next week contractors will begin to run the drift from the bottom of the shaft to the ledge, a distance of about 250 ft. Work will be prosecuted at both ends of the drift, and should, barring another accident, be completed in from six weeks to two months. There will be no opportunity to increase the force of miners until this work is done.

COPPER GULCH.—Work is being steadily prosecuted on the Comet mine by the Morrison Brothers. The drift at the bottom of the new 40-foot shaft is now 70 feet. There are several tons of very fine ore on the dump. The drift is being run on ore all the way from the shaft. The ore body has been improving and a large showing is made in the face of the drift.

REVIEW.—Salt Lake *Tribune*, April 7: The week has been rather stormy, but not at all harsh, the showers being seasonable. The movements of the metals have been light. The shipments out from this city for the week ending Saturday, the 11th inst., inclusive, were 56 cars and 1,436,375 pounds. The receipts of bullion and ore in this city for the week ending April 15th, inclusive, were: Bullion, $58,070.38; ore, $6,771.47; a total of $64,841.85. The week previous the receipts were $127,729.46, of which $113,429.46 was bullion, and $14,300 ore. The Ontario shipped during the week thirty-six bars of bullion, $24,610.38, making its total output for the present year $508,264.61. The Horn Silver is yet dormant; no shipments of bullion are reported, though some have been made. The Christy was the only shipper from the sandstone district this week. It sent two bars of silver, $3,220. The product of the Hanauer smelter for the week was eight cars of bullion, $20,900.

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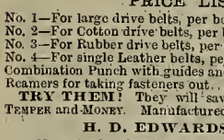

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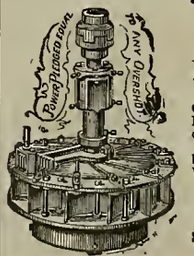

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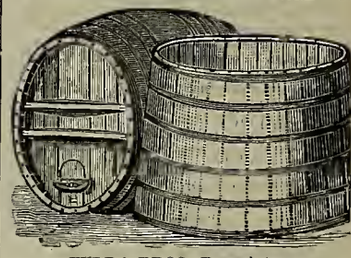

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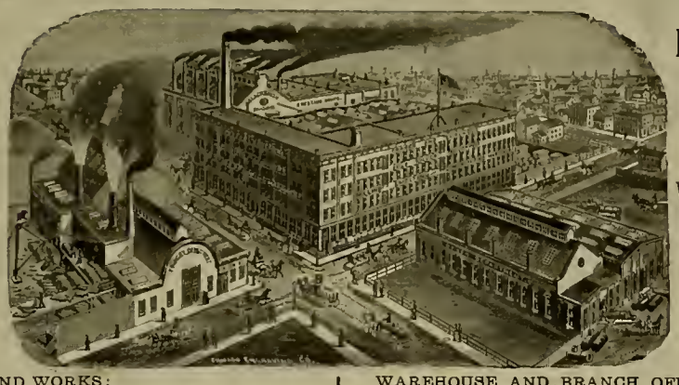

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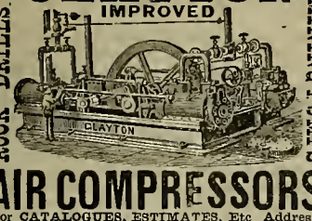

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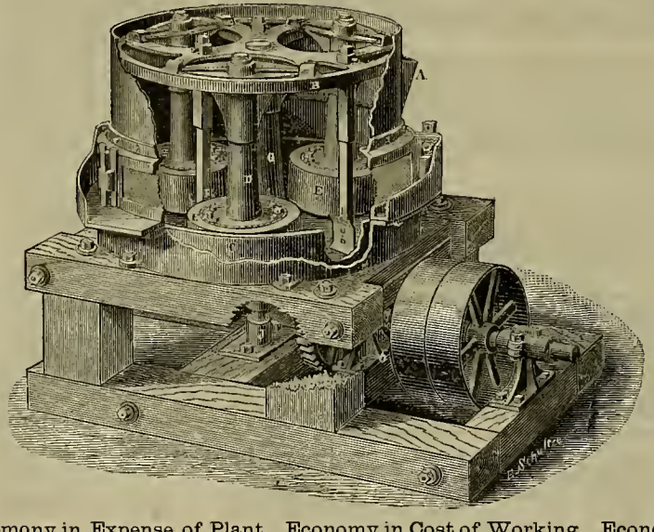

Economy in Expense of Plant. Economy in Cost of Working. Economy in Saving Gold. Economy in Transportation of Machinery. Economy in Cost of Erection of Mill at Mine. Economy in Time Required to Establish Plant (one day only being consumed).

The Huntington Mill has passed entirely through the experimental stage. Two years of continuous use at a number of mines in California has enabled the inventor to perfect and improve the machinery until he feels justified in assuring the public that he has reached THE ABSOLUTE in the construction of a perfect Quartz Mill.

ROCK BREAKERS, CONCENTRATORS
.....AND.....
Mining Machinery

Of Every Description. Send for Circulars.
.....MANUFACTURED BY.....
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FRASER & CHALMERS,
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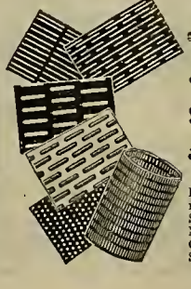

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J. W. QUICK, Prop'r.

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Ores worked by any Process.
Ores Sampled.
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Working Tests (practical) Made.
Plans and Specifications furnished for the most suitable Process for Working Ores.
Special attention paid to Examinations of Mines; Plans and Reports furnished.

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Ores Sampled and Assayed, and Tests made by my Process.
Assaying and Analysis of Ores, Minerals and Waters.
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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we are confident from our experience we can well suit the demand for these goods, both as to quality and price. Our New Illustrated Catalogue, with prices, will be sent on application.
☞ Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England.
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A BOARDING AND DAY SCHOOL FOR YOUNG LADIES.

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THE MISSES HARMON, Berkeley, Cal.
Or E. J. WICKSON, 414 Clay St., S. F.

A Glance Over the Mining Field.

Portland, Oregon, is to have a silver-lead smelter.

All the Horn Silver bullion that was on hand has been shipped out of Utah, and ore shipments from the mine have not yet been resumed. It is said the smelters are to be closed down for six months at least.

The great bulk of mattes produced in Butte, Montana, contain such a small proportion of arsenic that a most excellent metal can be obtained from them by the ordinary processes of matte concentration and refining. A considerable proportion of the product of the district is shipped to England for treatment; but it is rather for commercial reasons, and in some cases because of the better prices received abroad for argentiferous material, than from any necessity of seeking foreign aid to produce a copper of satisfactory grade.

The shipment of copper cement from Spenceville, Nevada county, California, for the month of March, amounted to 160,000 pounds, the largest shipment since the mine was opened.

The mill and mines at Marietta, near Aurora, in Esmeralda county, and abandoned on account of the refractory nature of the ores found in that region, have been leased by some parties who have succeeded after long experimenting in finding a process of working the rich ore at a profit. The first shipment of eight bars of bullion, valued at $5,000, was made last week, the result of one month's run. It is said that the copper taken from the ore in leaching is so pure and plentiful that it pays the entire expense of working it.

Placer mining promises to become one of the permanent and lucrative industries of Globe district, Arizona. All the gulches within a radius of several miles have been tested and gold in paying quantities found. Considerable time has been lost experimenting with various methods of sluicing, but now that the hydraulic system has been tried and proven so successful, it is likely to be introduced on claims where sufficient water can be obtained.

The new reduction works of the Paradise Valley mill are producing about 2,000 pounds of concentrates daily. The first shipment of 15,000 pounds of concentrates has been made.

P. W. Campbell, of Smartsville, a well-known hydraulic miner, who was fined $500 by Judge Keiser, of the Superior Court, of Yuba county, for alleged contempt of the order of the court in working his mine after being enjoined, and who refused to pay the fine, and who has been arrested several times for such refusal, was again arrested last week at Wheatland, and was taken to Marysville.

The Downieville *Messenger* tells the story of a miner near that place who has been digging a ditch "wrong end up," the end discharging the water being higher than the end at which the water is received. His engineering was at fault. This is not the first time the same thing has happened in California. A like piece of ditch construction was made in Placer county many years ago, and after several miles of the ditch was completed it was found that the water would not run to where it was intended it should go.

The court has ordered a new trial in the famous Albion-Richmond trial on the ground that the verdict was against evidence and obtained by fraud. The Albion Mining Company sued the Richmond for $500,000 for ore said to have been extracted by the latter from Albion ground. A verdict in favor of the Albion for $13,250 was given at the spring term of the court last year.

The old Raymond & Ely plant, including mines and complete machinery, at Pioche, formerly owned by the Raymond & Ely Mining Company, is offered for sale. Also one 30-stamp mill, and one 20-stamp mill at Bullionville. The machinery turned out an immense lot of bullion in the prime days of the mines of that section.

All work in the Eberhart and Aurora tunnel has been suspended for an indefinite period. A number of old and trusted employes who have worked for the company for the past twelve or fourteen years were among those discharged.

It is reported that work will soon be resumed in the May Lundy mill, and that the Mono Hydraulic diggings are putting in new pipes and getting ready to turn on the water.

About a month ago the managers of the St. Helena Mining Co. at Las Delicias, Sonora, stole a bar of gold bullion worth $13,000. The thief was never captured. A few days ago some men went to two saloon-keepers in an Arizona town and said they knew the man who had the bar and that he would take $1,000 for it. The saloon men went to the mountain indicated, found the man and bought the bar for $1,000 cash. They had it chopped up and sent to various points for sale; but what they had bought was found to be worthless brass or some other metal. The general verdict is, "it served them right."

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCA'N.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Andes S M Co	Nevada	26	25	Mar 2	Apr 8	Apr 30	B Burris	309 Montgomery st
Alaska M and M Co	Alaska	10	35	Apr 3	May 4	May 20	T J Hay	306 Pine st
Alaska Marble M Co	Alaska	1	03	Feb 25	Apr 18	May 16	J M Wilde	405 First st
Belmont M Co	Nevada	39	15	Feb 11	Apr 23	May 18	J W Pew	310 Pine st
Con Amador M Co	California	9	60	Mar 15	Apr 15	May 1	F B Latham	408 California st
Daisy Cement M Co	California	3	2	Mar 28	May 5	May 27	C J Collins	512 Montgomery st
Excelsior W and M Co	California	7	50	Sept 2	Apr 8	Apr 28	W J Stewart	215 Sansome st
Golden Fleece G M Co	California	1	20.00	Apr 18	May 25	June 15	F Schirmeier	Phelan Block
Hale & Norcross M Co	Nevada	84	50	Mar 2	Apr 7	Apr 28	E B Holmes	309 Montgomery st
Horseshoe M Co	California	4	2	Mar 9	Apr 11	Apr 27	A Berg	Grass Valley
Julia Con M Co	Nevada	23	10	Apr 6	May 13	June 5	J Stedfeldt	412 California st
Mayflower Gravel M Co	California	29	10	Mar 26	May 5	May 29	J Morizio	328 Montgomery st
Mexican M Co	Nevada	55	20	Apr 20	May 23	June 13	G D Edwards	414 California st
Noche Buena M Co	Mexico	1	11	Mar 27	May 8	May 29	C Hart	106 Battery st
North Star G M Co	California		1.50	Mar 5	Apr 9	May 1	D A Jennings	401 California st
Final Con M Co	Arizona	6	06	Apr 10	May 18	June 8	W Letts Oliver	328 Montgomery st
Puget Sound Iron Co	Wash Ter	11	50	Apr 14	May 25	June 25	A Halsey	328 Montgomery st
Pittsburg M Co	California	13	5	Feb 28	Apr 25	May 15	C J Bandmann	210 Front st
Rainbow M Co	California	13	15	Mar 14	Apr 21	May 20	P F Mohrhardt	307 Montgomery st
Sulphur Bank Q M Co	California	3	50	Feb 25	Apr 16	Jun 1	L Hermann	220 Sansome st
Summers Con M Co	California	3	05	Mar 17	Apr 20	May 12	F E Luty	330 Pine st
Tower Con M Co	California	2	10	Mar 11	Apr 15	May 5	G W Sessions	309 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Justice M Co	Nevada	R E Kelley	419 California st	Annual	May 1
Marsball M Co	California	A L Perkins	320 Pine st	Annual	May 2
Morgan M Co	California	C S Neal	304 Montgomery st	Annual	May 2
Papago Chief M Co	Arizona	S M Buffington	309 Montgomery st	Annual	May 4

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Kossuth M Co	Nevada	C K Sturtevant	328 Montgomery st	06	Mar 16
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Feb 13
Plymouth Con G M Co		W Van Norden, Pres.	23 Nassau st, N Y	60	Apr 6
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Feb 16

Mining Share Market.

The mining share market still keeps in an active condition, although prices have not been so well sustained this week as last. A number of prominent mining men have been visiting the Comstock, attracted there by the developments. The *Enterprise* says that all who have visited the two lower levels of the Hale and Norcross agree in pronouncing the very promising development at that point of great value and importance to the whole lode and country, as giving strong and very tangible reasons for believing that a good-paying mine will be found there, with the possibility of even an old-time bonanza. The cross-cut on the 3,000 level is not sufficiently advanced to prove and tangibly demonstrate that the good ore vein found on the 2,900 level widens and grows richer as it descends to that point; but, taken together with all other well-known conditions, the assurance is almost beyond a doubt that the ore body will be found richer and more extensive on the 3,000 level than above. Mr. Mackay unhesitatingly pronounces it the best prospect that has been found in the Comstock for the last six years.

Meanwhile, the management is doing all that men can do, under the circumstances, to develop the new find in the most advantageous manner. They do not claim it to be a genuine bonanza as yet, but hope to develop a good paying mine in due course of time.

Bullion Shipments.

Moulton, April 13, $30,604; 18, $19,200; Lexington, 14, $20,688; Silver Bow, 12, $12,680; Alice, 18, $29,880; Pittsburg Cons (Lewis Dist., Nev.), $1,000; Hanauer, 14, $2,500; Ontario, 14, $24,610; Christy, 14, $1,680; Vienna, 14, $2,060; Minnie Moore, 14, $1,150; Hanauer, 14, $5,000; Queen of the Hills, 15, $2,200; Hanauer, 16, $2,600; Christy, 16, $1,540; Minnie Moore, 16, $1,140; Ontario, 17, $17,356; Stormont, 17, $3,250; Hanauer, 17, $2,500; Queen of the Hills, 17, $1,200; Vienna, 18, $92,400; Hanauer, 18, $4,800; Minnie Moore, 18, $1,100; Christy, 19, $1,690. The banks of Salt Lake City report the receipts for the week ending April 15th, inclusive, of $58,070.38 in bullion and $6,771.47 in ore; an aggregate of $64,841.85.

Sales at San Francisco Stock Exchange

THURSDAY A. M., Apr. 23.

120	Alpha	1.00@1.05	
90	Bullion	40c	
150	Benton	10c	
80	Bodie Con	1.50	
600	Bulwer	30c	
100	B. & Belcher	1.95@2.00	
100	Chollar	1.25@1.30	
550	Con Va & Cal	.70@75c	
130	Crown Point	1.25	
420	Gould & Curry	1.60@1.65	
710	Hale & Nor	4.90@4.95	
200	Mexican	65c	
150	Mono	1.40	
525	Navajo	90@.95c	
230	Ophir	65c	
45	Potosi	65c	
2405	Savage	2.95@3.15	
230	Sierra Nevada	80c	

SIZE OF BEARINGS.—Mill shafting ought to have hearings four shaft diameters in length. It will save oil, bearing, metal and power to have them this long. They should be lubricated (notably, if they are too short), uniformly and continuosly, and not allowed to squeak before cooling and oiling.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Apr. 2.		WEEK ENDING Apr. 9.		WEEK ENDING Apr. 15.		WEEK ENDING Apr. 23.	
Alpha	.75	.80	.25	1.50	1.00	1.50	1.00	1.60
Alta	....	.25	.30	.40	.30	.65	.25	.55
Andes	....	.05	.35	.40	.40	.60	.30	.50
Argenta	....	....	....	....	....	....	....	....
Belcher	.75	.85	.90	1.10	1.00	1.45	....	1.50
Selding	....	....	....	....	....	....	....	....
Best & Belcher	1.05	1.15	1.50	1.95	1.90	2.80	1.85	3.20
Bullion	....	.25	.35	.60	.40	1.70	.40	.60
Sonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	....	....	.15	....	....	....	....
Bodie Con	1.95	2.20	1.65	1.75	1.40	1.60	1.40	1.60
Benton	.05	.10	....	.15	.10	.15	.10	.15
Bodie Tunnel	....	.30	....	....	....	.25	....	....
Bulwer	.30	.35	.35	.40	.30	.35	....	.35
California	.40	.45	.65	.95	.90	1.15	.60	3.70
Challenge	....	....	....	.25	.15	.40	....	.15
Obamplon	....	....	....	....	....	....	....	....
Chollar	2.05	2.15	2.70	3.30	3.15	4.75	1.40	4.25
Confidence	....	.80	....	....	1.25	1.50	....	1.15
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.40	.45	.65	.95	.90	1.15	.60	3.70
Con. Pacific	....	....	....	.65	....	....	....	....
Crown Point	.80	1.00	1.00	1.25	1.10	1.90	1.25	1.75
Day	....	....	....	....	....	....	....	....
Eureka Con	3.35	4.00	4.50	4.60	....	4.25	....	5.25
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	....	.25	.30	.35	.35	.45	.35	.40
Grand Prize	....	....	....	....	....	....	....	....
Gould & Curry	.85	.95	1.00	1.90	1.90	2 85	1.25	2.60
Goodsbaw	....	....	....	....	....	....	....	....
Hale & Norcross	6 50	6.12½	5.63	10.50	6.77	12.00	4.10	11.75
Holmes	4.75	4.80	....	4.75	....	4.50	....	4.00
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	.15	....	.20	....	.10
Justice	....	.15	.20	.30	.25	.40	....	....
Martin White	.60	.65	....	....	.45	.60	....	.40
Mono	1.05	1.15	1.10	1.20	.90	1.10	1.15	1.40
Mexican	.45	.50	.70	.80	1.00	.75	.65	1.35
Mt. Diablo	....	....	3.00	3.95	....	4.00	....	....
Northern Belle	....	....	....	....	....	....	....	....
Navajo	1.05	1.10	1.05	1.10	1.00	1.05	.90	.95
North Belle Isle	....	....	....	.15	....	....	....	....
Occidental	....	....	1.25	2.10	1.60	2.75	1.40	1.80
Ophir	.50	.55	.70	.80	.95	1.05	.20	1.25
Overman	.15	.20	.25	.40	.35	.40	.20	.35
Potosi	.90	.95	1.25	1.55	1.30	2.05	.70	1.75
Pinal Con	....	....	....	....	....	....	....	....
Savage	2.25	2.75	3.15	4.40	3.10	6.25	2.00	6.00
Sag. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	.40	....	.35	1.00	1.16	2.00	.70	1.50
Silver Hill	....	....	....	.10	....	.10	.05	.10
Silver King	....	3.40	....	3.70	2.60	3.00	....	....
Scorpion	....	....	.15	.20	.20	.30	.15	.25
Syndicate	....	.40	.45	.50	....	.40	.35	.40
Tiogs	....	....	....	....	....	....	....	....
Union Con	.45	.50	.70	.85	.95	1.70	.50	.65
Utah	....	....	.70	1.10	1.10	2.05	1.00	1.40
Yellow Jacket	1.00	1.95	1.80	2.40	1.80	2.35	2.05	2.90

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Apr. 23, 1885.

ANTIMONY—Per pound		-	@ —
Hallett's		12½	@ —
Cookson's		13	@ —
BORAX—Refined		7	@ 8½
IRON—Glengarnock ton		25 00	@ —
Eglinton, ton		23 50	@ —
American Soft, ton		27 00	@ —
Oregon Pig, ton		—	@ —
Clipper Gap, Nos. 1 & 2		26 00	@ —
Clipper Gap, Nos. 3 & 4		27 50	@ —
Clipper Gap, No. 5		25 00	@ —
Clay Lane White		26 00	@ —
Shotts, No. 1		26 00	@ —
STEEL—English, lb		15	@ 25
Black Diamond, ordinary sizes		12	@ —
Plow		6	@ 8
Machinery		10	@ 12
Sanderson Bros		13	@ —
COPPER—			
Brazers' sizes		—	@ 25
Fire box sheets		28	@ —
Bolt		22	@ —
Yellow Metal		14	@ 15
Ingot		—	@ —
LEAD—Pig		14	@ 15
Bar		5	@ —
Pipe		7	@ —
Sheet		8	@ —
Shot, discount 10% on 500 bag	Drop, $ bag.	1 85	@ —
Buck, $ bag		2 05	@ -
Chilled, do		2 25	@ —
TINPLATE—Oldcastle		5 25	@ 6 00
Charcoal		5 75	@ 6 75
Coke		6 25	@ 6 50
Roofing		6 25	@13 50
ZINC—German		9	@ 10
Sheet, 7x3 ft, 7 to 10 lb, less the cask		9	@ 10
QUICKSILVER—By the flask		33 50	
Flasks, new		1 05	@ —
Flasks, old		85	@ —
NEW YORK PRICES—			
California Borax, refined		8	@ 8½
Pig Iron, American No. 1		18 00	@ —
Quicksilver		43½	@ 44
Lead		3 70	@ —
Copper		11	@ —
Tin		18¾	@ —
Bar Silver		1 07⅞	@ —

A METAL that expands in cooling is made of nine parts lead, two parts antimony, and one part bismuth. This alloy can be advantageously used to fill small holes and defects in iron castings

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & CO.'s SCIENTIFIC PRESS PATENT AGENCY, 262 Market St., S. F.

FOR WEEK ENDING APRIL 14, 1885.

315,695.—CANDLESTICK—A. Hermann, Drain, Or.

315,700.—TYPE-WRITING MACHINE—E. S. Belden, S. F.

315,701.—TYPE-WRITING MACHINE—E. S. Belden, S. F.

315,702.—TYPE-WRITING MACHINE—E. S. Belden, S. F.

315,782.—SEED PLANTER—R. L. Taylor, Santa Barbara, Cal.

315,950.—LIFE-PRESERVER—C. Leduc, S. F.

315,651.—TRAVELING THRASHER—W. Norton, Orland, Cal.

315,824.—ORE CONCENTRATOR—C. W. Patten, S. F.

315,825.—ORE-GRINDING MILL—A. B. Paul, S. F.

315,992.—CABLE RAILWAY—Henry Root, S. F.

315,853.—INSERTIBLE SAW-TOOTH—N. W. Spaulding S. F.

315,566.—HINGE JOINT—Menzo Spring, S. F.

315,583.—ORE-CRUSHER—W. E. Wild, S. F.

12,118.—TRADE-MARK—Cal. Fig Syrup Co., S. F.

12,130.—TRADE-MARK—Paraffine Paint Co., S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

BURGLAR ALARM.—Ira G. Leek, S. F., No. 315,152. Dated April 7, 1885. This is an alarm device to be used on doors for the purpose of announcing the opening of the door on the entrance of a person going into the room, and it consists of a gong or bell with a disk supporting a hammer and operating mechanism having a central opening through the two for the introduction of the shank of the door-knob, the gong or disk occupying the place of and forming a rosette, which is secured to the inside of the door between the door and the knob.

LIFE-PRESERVER.—Constant Leduc, S. F., No. 315,950. Dated April 14, 1885. This life-preserver is of that class in which the buoyant property is supplied by suitably arranged bunches of the dried stems or stalks of palms, rushes, reeds, etc., but preferably of the tule grass which grows so abundantly in California, and the use of which in this connection is patented by the same inventor. The present invention consists in the novel formation and arrangement of the bunches and their connection to form a complete life-preserver, without the use of any external covering sack or skin of canvas or other material, such as is usually employed.

HYDRAULIC ENGINE.—Samuel N. Knight, Sutter Creek, Amador Co. No. 314,689. Dated March 31, 1885. This is an engine by which pumps or other reciprocating apparatus may be driven. It consists in a combination of devices, and is "a hydraulic engine, having a main cylinder, piston and piston-rod, transversely placed valve-chambers at the ends of the cylinder containing valves, and supplemental cylinders and pistons, valve stems having rollers attached, and valves by which water is admitted to and exhausted from these cylinders, in combination with an arm on the piston and inclined plates adapted to move the valve stems of the supplemental cylinder to their own motion."

DRYING APPARATUS.—Orlando B. Hardy, S. F. Assignor to Giant Powder Co. No. 315,141. Dated April 7, 1885. This invention relates to certain improvements in that class of drying apparatus in which a series of endless belts are arranged to travel one below another and alternately in opposite direction, so that the material falls from one belt to the next below and is carried backward and forward as it descends, until it reaches the discharge next below it. It consists in certain improvements in driving the belts independently of each other, or a means for keeping them extended transversely, and in details of construction. In the machines hitherto constructed with a series of belts one above another, the driving rollers are located at the same end of the machine, and are driven by a single ordinary belt. The result is great friction and a heavy strain on the driving belt as well as upon the carrying belts, which are moved by driving rollers at their ends. To avoid these results Mr. Hardy first divides the entire motive power into ten parts, so as to apply it at the proper end of each belt, and again divides the power at each end in order to apply it as nearly direct as practicable, and apply it to the rollers at their discharge end so that the driving rollers shall draw directly on the upper and loaded half of the belts, and finally use chain belts to avoid excessive friction and consequent strain and wear. The apparatus is specially designed for use in powder manufactories.

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MOTION OF THE SUN.—It has been hitherto supposed that the solar system is moving toward the constellation Hercules; but the investigations of Prof. Plummer, of Oxford, lead him to believe that the point toward which we are moving is nearer the constellation Lyra than has been generally suspected. As it is not likely that the sun describes a straight line in space, it becomes important to collect all possible information which may help us to ascertain the exact form of its orbit.—*Nature.*

NOTICE

Is hereby given that a meeting of the stockholders of the Lord of Lorn Gold and Silver Mining Company (a corporation) will be held on the 11th day of May, A. D. 1885, at one o'clock P. M., at the office of said corporation, in room No. 6, in building No. 318 Pine street, in the City and County of San Francisco, California, for the purpose and with the object: First, of increasing the capital stock of said corporation, so that the whole amount or par value thereof shall be $10,800,000, divided into 108,000 shares of the par value of $100 each; and, Second, to repeal the by-laws of said corporation, or any part thereof, and to amend the by-laws, or to adopt new by-laws therefor, as said meeting may determine. By order of the Board of Directors and Trustees, and of the President. March 7, 1885. JAS. T. MCDOUGALL, President.
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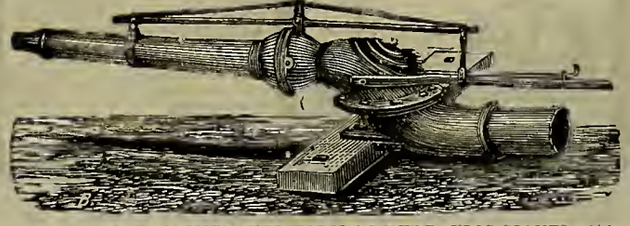

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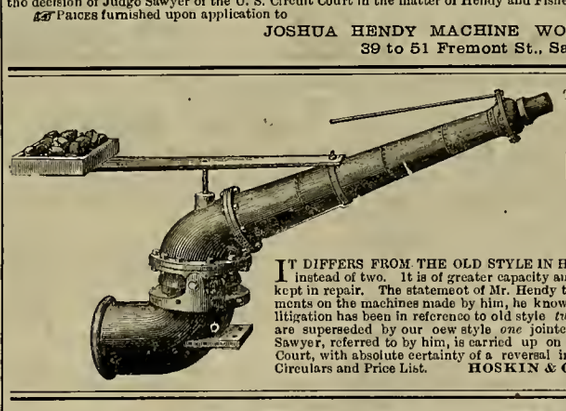

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Buyers take advantage of the fact that much of the wool in our market contains burrs. This is no longer a great drawback, except from the shrinkage it occasions. After the wool is sorted and scoured, the burry parts are run through a burring machine, which cleans it from all vegetable matters, leaving the wool as good and as valuable as the rest. All scoured wools find a readier sale; at the same time all the imaginary drawbacks that the wool growers are suffering from are obviated. There is much wool in our market at present, selling at 9, 10 and 11 cents per pound, that will not shrink over 60 per cent. If it cost 10 cents per pound, shrinking 60 per cent, when scoured and ready for the manufacturer to use it would cost 25 cents and freight to the East 2½ cents, the rate for scoured wool laid it down in Boston would be 27½ cents per pound. The same scoured wool is worth in the Eastern market from 37½ to 40 cents per pound, and is in demand. If the above means were adopted, there is no doubt but the grower would realize at least from 12 to 15 per cent more for his wool than by the present mode of disposing of it.—*S. F. Journal of Commerce.*

WOOL SCOURING is becoming quite a business in San Francisco. There are now seven establishments engaged in this industry. The high freight on wool to Boston makes it decidedly profitable to scour it here, thus saving a freight on about 70 per cent of waste matter. There is quite a discrimination, however, in freights, according to the value of the wool transported. Freights by railroad are 1½c ₩ lb on wool costing 12c ₩ lb or under; 1¾c ₩ lb up to 18c ₩ lb and 2c ₩ lb over 18c ₩ lb; but the quantity of the latter is not very large. By ship to New York, around Cape Horn, it is 1c ₩ lb. The freight on scoured wool is 3c ₩ lb. As a general thing growers are disinclined to have wool scoured for their own account to any extent, but if they continue to hold it as high as they heretofore generally have done, they will soon have to take this risk on themselves.

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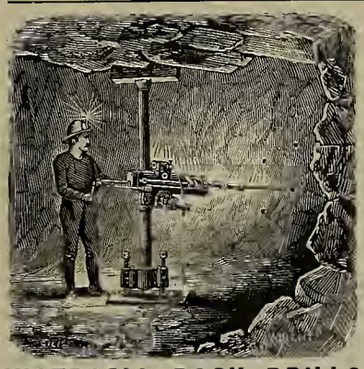

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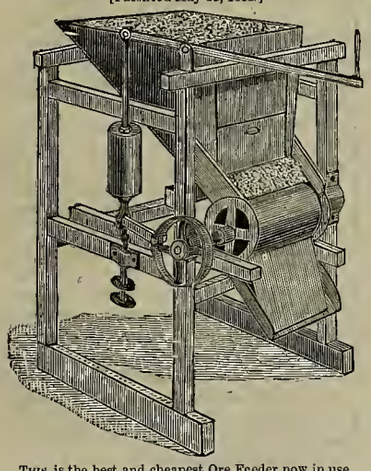
[Patented May 28, 1882.]



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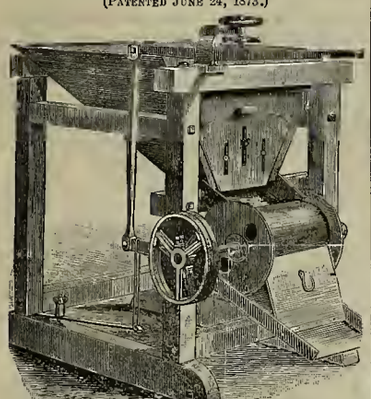

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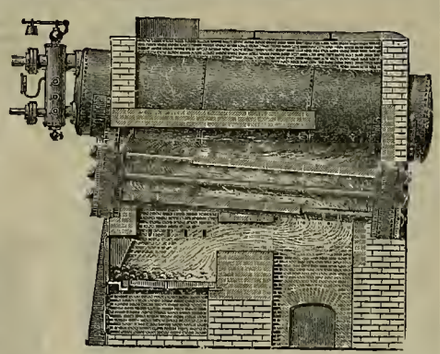

TESTIMONIALS.

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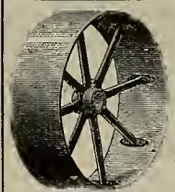

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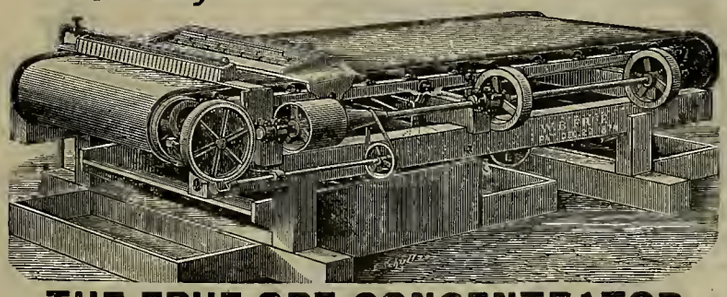

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The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement on patents owned by them.

Protected by patents May 4, 1869, Dec. 22 1874, Sept. 2, 1879, April 27, 1880, March 22, 1881, Feb. 20, 1883, Sept. 18, 1883. Patents applied for.

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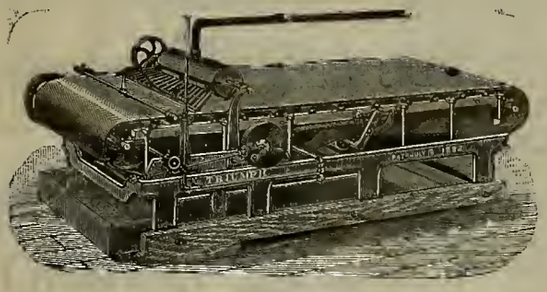

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These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarly saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with accurate deductions therefrom, will soon be published in Circular form.

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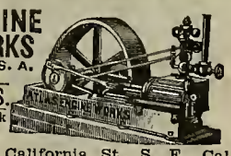

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, MAY 2, 1885.

VOLUME XLXX
Number 18.

A New System of Ore Sampling.

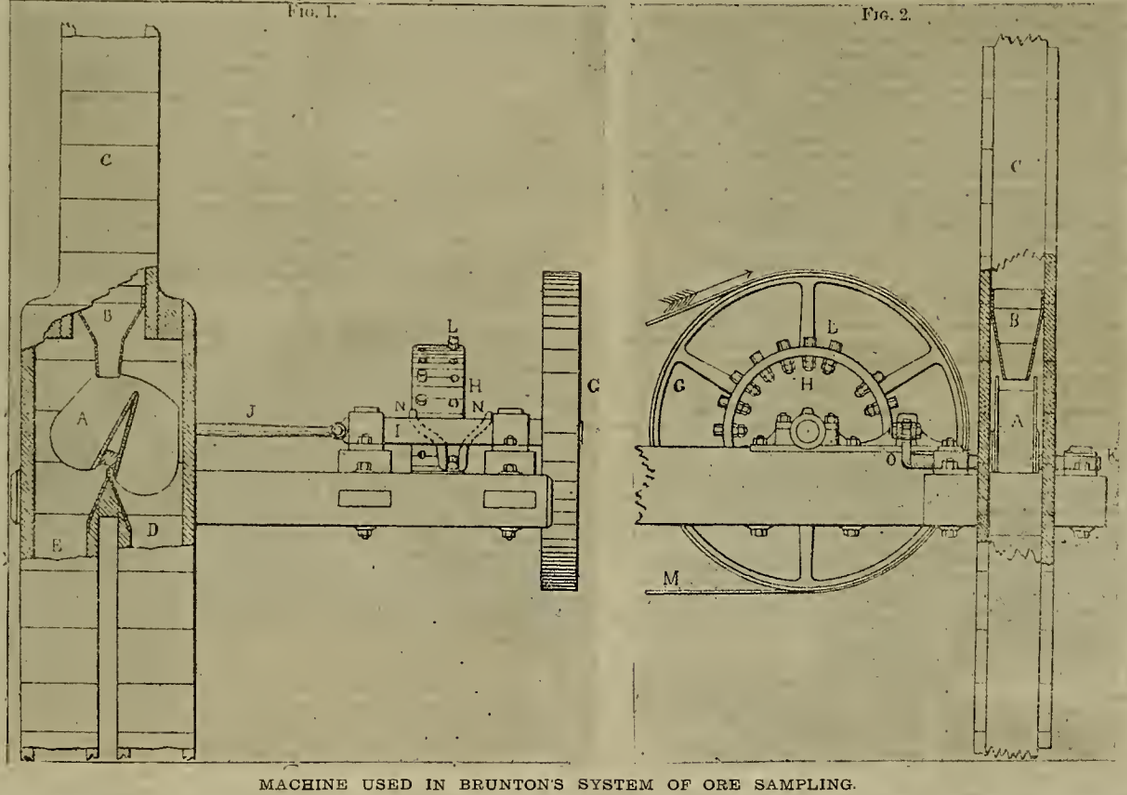
Sometime since the attention of Mr. D. W. Brunton, of Denver, Colorado, was called to the defect in the present methods of public ore sampling, and it was requested that he would investigate the matter and devise some method which would yield accurate results, satisfactory to both the miner and the smelter, and at the same time permit the sampling of ore with extreme rapidity, and at the lowest possible expense for attention and repairs. In a paper read before the American Institute of Mining Engineers, Mr. Brunton in describing a new system of his own, says:

After examining into the matter for some time, and taking into consideration the marked preference of the principal ore-buyers for coarse ore, the writer decided that it would be necessary, on account of the known objections to avoid splitting or dividing the falling stream, and instead of dividing the ore to make the division one of time — something which could be divided with exactitude and to infinity. With the new machine the sample is obtained by *deflecting* the *entire stream*, alternately to the right and to the left, the relative proportions of these two divisions to each other being determined by the difference *in time* between the deflections to the right and the deflections to the left. The construction and operation of the machine will be readily understood from the accompanying drawings, in which C is a vertical or inclined spout, containg a falling stream of ore; B is a funnel for narrowing the width of the falling stream, so as to reduce to a minimum the necessary travel of the deflecting-chute, A. This chute, A, is pivoted upon the rock-shaft, K. When it is deflected to the right the entire stream of ore is thrown into E; and when it is deflected to the left the entire stream is thrown into D.

The deflection is caused by the movement of the crank, O, receiving its motion from the driving-bar, I, and connected with it by the pitman, J.

The driving-bar, I, receives its motion from the pins, L, in the face of the revolving-wheel, H, which is driven by the pulley, G, receiving motion from a line-shaft through the belt, M. The face of the wheel, H, is perforated with two rows of holes, the distance between the two rows being the same as the necessary movement of the crank, O. Into these holes are inserted a number of pins, L, held in place by jam-nuts on the interior of the wheel-face. Preferably, twenty holes are bored in each row, each hole or pin representing five per cent of the time necessary for a complete revolution of the wheel.

Now, if fifty per cent of the pins are placed in the right-hand row of holes, and fifty per cent in the left, then the revolution of the wheel, H, carrying the pins, L, through the guides, N N, on the driving-bar, I, will hold the deflecting chute, A, on the right during one-half of the revolution, and on the left during the other half, thus dividing the stream into two equal portions.



MACHINE USED IN BRUNTON'S SYSTEM OF ORE SAMPLING.

If twenty per cent of the pins are placed in the right-hand row, and eighty per cent in the left, then the deflecting chute, A, will be held on the right during one-fifth of a revolution and on the left during four-fifths, thus throwing twenty per cent of the ore into the spout, E, and eighty per cent into the spout, D, etc.

In practice the wheel, H, is driven with considerable velocity, so as to make the divisions of time as minute as is practicable without injuring the machine by excessive vibration.

In improved machines now being built, although the principle is identical with the above, the construction is somewhat different. Sliding motion, always objectionable in dusty situations, is wholly avoided, and the pin-wheel, H, is enclosed in a tight iron case, filled with oil. This arrangement, while far from complicated, is exceedingly compact, the journals, wheel, case and frame being in one casting: but, owing to the position of the different parts, it is very difficult to explain by cuts; hence the employment of the other drawings in the foregoing description.

When in use the machine runs noislessly, without either jar or vibration, and never clogs, no matter how wet or how full of chips, rocks and strings the ore may be. Two of these machines have been running steadily for the past six months, during which time they have given complete satisfaction to seller, sampler and buyer. No errors in sampling have ever occured, even upon the richest ores. Not a cent has been spent upon either alterations or repairs, and the attention bestowed upon the machine has been restricted to a daily oiling.

As the stream of ore is neither split nor divided, fine crushing on large samples is entirely unnecessary. After the ore has been broken in a Blake or Dodge crusher, it falls into an elevator and is raised a few feet above the level of the storage-bins. The sampler is placed between the elevator discharge and the top of the bin, so that the ore falls through the divider which throws out, for a sample, any amount per cent to which the machine may be set.

In practice this amount varies from 10 to 50 per cent, according to the value of the ore; the richer and more "spotted" the mineral the larger sample should be taken.

The rejected ore drops directly into the storage-bins, while the sample falls through a spout into a pair of rolls placed on the same level as the breaker.

With most ores, from 10 to 20 per cent has been found to be amply sufficient for a coarse sample; and, as at least 80 per cent of the entire lot is generally sent to the smelter as it comes from the breaker, there is no objection to setting the rolls close, especially as they only crush from one-tenth to one-third of the amount of ore handled.

After being crushed fine by the rolls, the sample is raised by a smaller elevator to the same level as as first, and drops through a second divider, set to take any desired amount per cent.

The rejected ore falls into the bin with the ore from which it is at first separated, and the final sample drops into a closed and locked bin on the working-floor below.

On ordinary ores, 10 per cent of 20 per cent, or 2 per cent of the original quantity, is an all-sufficient sample; while on richer rock 15 per cent of 30 per cent, or 4½ per cent of the original quantity is perfectly safe. By this plan only a small proportion of the ore is crushed fine—a very decided advantage for smelting purposes over all of the other systems, which require that the ore must be rolled before a sample can be taken.

The two machines are driven at different speeds, to prevent any possible error which might arise from isochronal motion. In testing these machines by resampling lots of ore, it has been found that the limit of error is less than one-half of one per cent, while even the best "hand quartering" often varies as much as two per cent.

The weight of the sample actually taken even on the largest lots, never varies more than a few pounds from the percentage to which the machines are set. As the division is one of time, not of ore, it follows that the machines will take the percentage to which they are set, whether the ore passing through them be wet or dry, light or heavy, coarse or fine. This fact is of the utmost importance to the sampler, as it enables him to obtain a correct sample of intended mixtures, by simply passing the different lots through the crushing machinery in succession. Not only will the ore delivered in the sample-bin represent an exact average of each lot, but the amounts taken will bear the same relative proportion to each other as did the original lots, and the entire sample will consequently represent an exact average of the whole.

Under this system the cost of sampling is reduced to the lowest possible limit, the principal and almost only items of expense being power and the cost of wheeling ore into the rock-breakers; and since the accuracy of the samples is in no way dependent upon the skill of the workman, the very cheapest labor may be profitably employed.

The Western Union Telegraph Company threatens to take down the wire between Elko and Tuscarora unless the practice of using the telegraph poles for fuel, which prevails among teamsters, is stopped.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

King Gold.

EDITORS PRESS.—The letters of A. B. Paul and W. N. Griswold, recently published in the PRESS, are among the straws that show which way the wind blows, or rather, they are "cat's-paws" indicating the quarter from which the tempest will come. The sand-lot affair was only a premonitory and transient squall. The naive admissions of the first-named writer show that if his views lack profundity his heart is right.

My attention is particularly attracted by this sentence from Griswold: "It is well for all to begin to understand that much that we complain of is caused by a system which has in it the elements of periodical distress, *and ultimately of unbearable oppression.*" The Italics are mine, and I will add that if this system is not changed before America is filled, I pity the world.

While I agree with Mr. Griswold that a sudden change, that is sudden and profound, is not desirable, I will venture to predict that unless a gradual one takes place, and begins to take place rather soon, there will be one so remarkably sudden and thorough as to astonish some people.

If Thomas Paine could see the world to-day I think he would be compelled to admit that his views of political economy in 1792 were both short-sighted and superficial. The causes of the "evils of which we complain" lie deeper than forms of government; they exist primarily in the human heart, to use the conventional term; secondarily, in the structure of society which, instead of a homogeneous mass, is an aggregation of heterogeneous particles, loosely coherent by virtue of their collective needs, mutually repellant, warring among themselves, because of their individual desires which they mistake for interests.

This style of things is perhaps inevitable in the transition from barbarism, and as violent remedies have generally proved failures in the long run, it would seem to be the wisest part of of those who can in any degree, by tongue or pen or purse, influence the course of events, to endeavor so to direct the blind, stupid, yet terribly earnest, groping and yearning of the masses as that their efforts shall not recoil in disaster upon themselves. Particularly should the rich, many of whom really desire to benefit their kind, be made the subject of missionary enterprise on behalf of the religion of humanity.

It is a standing reproach to those who find fault with the present state of affairs throughout the civilized world, that they do not propose any remedy that has not been tried and found wanting, or that is not manifestly impossible. Fire and sword, dynamite and destruction, are in the first category; the perfect commune, the dream of enthusiasts, possibly the ultimate, but very remote hope of the human race, is clearly to-day in the second.

These facts, for facts they are in the opinion of many, have a tendency toward causing a feeling of despondency which, however, should not be allowed to prevail, for if we can only contrive to bring the ship of our modern civilization gradually to head in the right direction, such wreck as numerous other craft of similar character have suffered may perhaps be averted.

I am not a "socialist" as the word is understood. While I repudiate with scorn the silly and vapid argument of many who know not of what they speak, that "division would be useless since inequality would again arise," —the very principle of the commune is not to divide—yet I see clearly that the practicability of a true community on any extended scale is, to say the least, a long way off; but I affirm that the elements of the commune are in existence and in operation among us to-day, to a certain and an increasing extent, though not often recognized, and, if we can avoid a cataclysm, I believe that a satisfactory result will at least be reached, and then we shall be *civilized*. But it is hard for those who suffer much to wait. The cataclysm is imminent, and I repeat that it behooves all who can do anything to use their best efforts to avert it, not by attempting to maintain the *statu quo*, not by endeavoring to dam the gathering flood, not by erecting breastworks against the deluge, but by gradually opening such channels as may, by admitting of progressive movement, forestall and prevent the disastrous consequences of the sudden outbreaking of an "irresistible force" before which supposed "immovable objects" will be swept away like hay-stacks before the blizzard. As to finding or proposing remedies, it is certainly very desirable, but the inability to do that need not prevent our discussing a subject which will soon force itself upon the attention of all, even the butterflies. There may be something in Mr. Griswold's suggestion, if there is any practicable way of working it out, but I think he does not go deep enough by a very great deal. On the other hand I do not by any means imagine myself wise enough to solve a problem which has puzzled so many good heads, but I do think that before we can hope to accomplish much, we must abolish certain idols from the worship of which, our best political economists have not freed their minds. We must get down to some bottom *facts*, take our stand on them and work to build, not to destroy anything rashly, nor until we are ready to replace it by something better.

This communication is long enough. If it appears desirable, I will, in a future letter, offer a few suggestions as to what those idols are, and what those facts, or some of them, may be.

C. H. AARON.

Placer Mining and Electric Lights.

EDITORS PRESS:—I am prompted to address you by an item which appeared in the PRESS of February 28th, and an editorial on the revival of gold mining, which appeared March 7th. In the former you mention the fact that one Geo. L. Wright has gazetted a patent which annihilates the chief expense of producing electricity by appropriating the power in the current of rivers. Your illustration of the possible result of such an invention (if fully confirmed), of being able to light up the channel of the Mississippi like the streets of a city, is no less startling than true. But looking at its diversified application and use here in California, I conceive that it is destined to work a most marvelous advance in placer mining in the hills of northern California. Nearly four years ago, while writing up the placer mines of the Klamath river, I made the expression that an untold fortune awaited the man who should invent a method of arresting the limitless power going to waste in the current of the Klamath river; harness it and set it to work forcing water on to the high gravel hills which exist on both sides from Happy Camp to the ocean. If the invention which your paragraph mentions does the work claimed, will not my suggestion have become possible? The current of the Klamath will average nearly three miles an hour, and the gravel benches rise one above the other from 500 to 2,000 feet, and the higher they are the coarser the gold. The deposits in many instances cannot be exhausted in generations of constant operations. With such an invention what an open and broad field is here for the revival of the gold-getting industry. I regard this section of country as being marvelously rich in auriferous deposits, but that it has been skimmed over by the early prospecting adventurer, leaving the actual development to come with the application of close business methods to the work of mining. WM. AYRES.

Klamath River, April 16, 1885.

Good Clean-up.

The *Amador Sentinel* says: The excitement of the week has been all about the recent clean-up at the St. Julian, which only goes to prove the existence of a continuous streak of rich ore in that promising claim. For a number of weeks they have been working in a quiet way in a drift connected by a shaft sunk from the tunnel. This shaft is 25 feet deep, and they drifted south 30 feet and north 15 on a rich seam of ore, varying from a few inches to four feet thick. So far as we know all these horizontal strata make pay in butting against the slate wall, but in this case the formation was reversed, the big pay being close to the granite. Of course this stratum extended to the slate and was rich in metal close to the wall. In extracting this ore the miners kept the heavy, coarse ore separate, in full amounting to 800 or 1,000 pounds, and some of the pieces were large, heavy chunks of almost pure gold. Last Friday morning about 10 o'clock the 1-stamp mill was started upon this rich lot and by 10 o'clock the following morning the clean-up was finished. The retorted amalgam yielded something like 10½ pounds avordupois weight. On melting, the bar is said to weigh 168 ounces. Now convert this into troy ounces and we have 153 ounces and a fraction. The mint returns on a former bar from this mine rated the gold at about $17.50 per ounce, and at that price the present will yield something like $2,680. It must be remembered that only the lot mentioned was milled, together with a small quantity of common ore to keep the silver bright. The plates were heavy with amalgam. All of the tailings were carefully saved to be worked over at some future time. The second quality extracted from the same place amounted to about two tons still in the tunnel. Good judges think that when the whole is treated the company ought to realize at least $5,000. It is by far the richest strike ever made on this claim, and will doubtless stimulate the owners to continue prospecting. Recently they replaced the framework on the mill, added a new pulley run on the cam shaft, put in a Knight wheel, and now they have everything as convenient as one could wish. Ten inches of water from Horne's ditch is ample to run the mill. John Price is boss, takes all the responsibility and is getting rich by the sweat of his brow.

ITALIAN IMMIGRATION.—It is expected that the Italian immigration to this country this year will be greater than ever before. The industrial depression in Italy, growing out of the cholera last year, is unprecedented. Riots among the working people out of employment are prevented only by troops.

THE value of the ship-building industry of New England for 1884 reached $6,000,000.

Tuolumne Quartz Mines.

From the letter of a correspondent of the *Bulletin* we condense the following information concerning the mining interests of Tuolumne county, in this State.

Quartz mining is the only description of gold mining now prosecuted in this county since the exhaustion of the placers. The first quartz mine of permanency discovered in the county was the Soulsby, situated about ten miles in an easterly direction from Sonora, the county seat. This mine has, like many others, had its ups and downs, but since the time of its location in 1857 has yielded millions of dollars. The south shaft, from which the stoping has been done, and from which most of the gold has been taken, is down a depth of 700 feet, and a few weeks ago a new chute was discovered which is reported to be very rich.

Between the North Fork and Main Tuolumne River.

There is a group of mines situated between the North fork and the main Tuolumne river, all of which are considered good property, but perhaps the most promising one is the Buchanan. Like the Soulsby, this mine has passed through many vicissitudes. Rich on the surface, a poor spot, and the inevitable result, where mines are owned by poor men with nothing but their hands to work with. For want of capital to develop it properly it was abandoned, only to be reopened by a company, who after two or three unsuccessful efforts to discover the pay chute in turn abandoned it. The experiment was repeated with the same result until finally a company, of which Alviuza Hayward is a member, obtained possession of it and were successful in finding what their predecessors had been hunting for, with the result that there are now several tons of quartz on the dump taken from the chute while drifting, which it is estimated will pay from $100 to $1,000 per ton. The worst drawback to this mine is in its accessibility. The company, it is said, is contemplating the erection of a mill this spring and summer, and with that view have had a survey made for a new wagon road, which, to secure a proper grade, will necessitate a circuitous route and cost a considerable sum of money. Although the company are very reticent about the mine and its prospects, it is generally believed to be one of the best in the county.

Other mines in the same locality are the Hunter, Spring Gulch, Starr King, Sherman and Somerset. These mines were all rich on top, but require capital to develop them.

North Fork Mines.

The New Albany (formerly the Brown and Clayton), Grizzly, Consuelo and Bonito are situated on the North fork, but with the exception of the former have lain idle for a number of years. All of these mines were discovered during the early quartz excitement and at that time were worked and all yielded fairly. The mills on the three latter have been suffered to decay, and what remains of them stands as a monument to the once busy scenes along this stream. The mill on the New Albany mine was erected about eight years ago and is in good running order. A few days ago Dr. Walker set some men at work excavating for the purpose of erecting a larger wheel at the mouth of the shaft for hoisting purposes; and in blasting down the hanging wall a new vein was found which shows gold freely, and present indications are favorable for a good chute of rock.

New Enterprises.

Within the past year several new enterprises have been started, the most successful of which was the reopening of the Deadhorse mine by Messrs. Hayward, Skae, Davis and others of San Francisco. This mine is the south extension of the old Eureka mine, situated at Summerville. The Eureka was discovered soon after the Soulsby, and paid large dividends for a number of years. The mine was worked to a depth of 600 feet, but the chute pitched south at such an angle that it was so far away from the main shaft and so near the ground claimed by the Deadhorse location that the company concluded that the outlay in sinking a new shaft would not be repaid, and consequently the mine was patented and has been allowed to remain idle ever since its abandonment, some 20 years ago or over. With the collapse of the mine went the town, with the exception of a few families and the store. Those who remained turned their attention to farming, and but little mining has been done in the neighborhood until the recent starting up of the Deadhorse. Last spring Messrs. Hayward, Skae, Davis and others purchased the Deadhorse at a nominal figure and immediately commenced the work of cleaning out an old shaft sunk long ago. No one knew how deep the shaft had been sunk, and after cleaning out some 20 feet of slum, the bottom was found, together with a few old rusty drills, a striking-hammer and a crowbar, showing that the last shift left their tools and the mine never to return. On commencing work on this mine the calculation was made that the pay chute would not be found until a depth of 500 or 600 feet had been reached, but after sinking 100 feet a drift was run and a good vein discovered. The shaft is now 320 feet deep with a good vein in the bottom, and in each of the three south drifts, which are run at intervals of 100 feet. A mill will be erected on the site of the mine, the company being satisfied from the tests made of the quartz at other mills that the property will warrant the outlay.

The Lamphier mine, formerly under the superintendency of Richard Chute, of San Francisco, is, comparatively speaking, a new mine. It is but a short distance from the old Confidence mine, which in its day produced a large amount of gold, but which is now a mine of the past, as are Mt. Vernon, Excelsior, Plowboy, Greene and many other mines in that locality.

In the Cherokee district mining is at a standstill.

The miners are prodding away in the south end of the county with untiring energy. Most of these mines are new ones, and but little can be said with definiteness as to their worth. Messrs. Lang and Shaw have erected a mill on their vein and are now prepared to extract gold.

During the past few months, if reports are correct, a number of rich strikes have been made in different parts of the county, but whether these reports are authentic or not remains to be seen. Parties making these strikes are chary about giving them circulation, for reasons best known to themselves. The Chrysalline mine, situated on the mother lode, near Jamestown, it is said, is about to prove a veritable bonanza. According to report a rich strike was made in it, and it is claimed that the owners have between $100,000 and $200,000 in sight. It is also said that gold can be seen in the vein in such quantities that a magnifying glass is not needed to see it. According to the local papers a man, in digging a ditch near Jamestown, recently, came upon a quartz vein, and in a reasonably short time took out $30,000.

Eureka District.

At no former period in the history of Eureka have times been as quiet and dull as at present, and yet the prospects of the camp have never, in our opinion, been brighter. We base this latter statement upon the real merits which a host of the mines of the district actually possess. In all directions, from Mineral Hill on the north to Secret Canyon on the south, there are evidences of wealth which inspire hope and confidence that the bullion yield will again, just as soon as we get capital interested in our midst, equal that of the past. The number of producing properties in the district have never been greater, and could assistance be rallied in behalf of those who are now working their properties on the limited scale which necessity compels them to, there is no doubt but that the prosperous era we predict would shortly follow. Many locations which have hardly been known, even by name, to the oldest residents of the district, have, within the past few months, made such improvements as to convince the most skeptical that Eureka mining district possesses decided merit, and presents a field for capital as good, if not better, than can be found elsewhere on the Coast.

It is believed by many, beyond a peradventure of a doubt, that the Richmond Company have a large body of ore in their mine, which, when they get ready, will be extracted. The Eureka Con. mine is looking better to-day than it has at any previous time in the past year and a half. Ore of good quality is being extracted from upward of fifteen pitches in the property, and at the company's works all the bins and available space is glutted with ore awaiting reduction. It is estimated that they have on hand nearly 2,200 tons. At the Richmond works quite a good deal of custom ore has collected. The furnaces of the two companies, it is believed, will be in full operation by the middle of May.—*Eureka Sentinel.*

LOCATING A LAKE.—Almost, if not quite, the whole shore of Owens lake has been located, says the Inyo *Independent*. The power of attorney for making these locations was granted to L. F. J. Winkle, of Virginia City, and bears the name of 869 locators. The fees for recording the locations amount to $225.50. That much, at least, is assured to the county for the present. If the only object of making these locations was to make evaporating tanks for getting the matter held in solution in the water of the lake, then a mile or two of the lake shore would afford ample room for the most extensive operations that could be well conducted. By locating the entire circumference of the lake it might appear that the locators expect the entire lake to dry up, and they want to secure all the enormous quantity of matter that would be left in its bed. Before the bed of the lake could become dry Owens river would have to be diverted from its present course, and the water be disposed of in some other way. This implies irrigation on a scale of such magnitude as is hardly likely to be undertaken soon. In any event, if these locations will develop any new industries in the county, and promote the utilization of any of the natural resources, the county will be the gainer thereby, and the locators or promoters, no matter who these may be, should have the good wishes of the citizens of the county, and general countenance and support in their work.

TELEGRAPH wires have to be renewed every five or seven years. The Western Union Company exchange about 1,000 tons of old wire for new every year.

MECHANICAL PROGRESS.

Hidden Flaws in Metal.

What is really needed, says the *London Builder*, is some system, could such be devised, by which those hidden flaws which the very best metal, made by the very best process, will sometimes contain, should be rendered patent to the eye of an inspector. Is there any chance of such a system being devised? It is clear that chemical tests are quite useless; they can tell nothing but the general composition of the metal. Electric tests may possibly yet be used with effect. They were proposed some years ago, and have revived lately by Pro. Hughes, the inventor of the microphone. With this beautiful instrument, the "magnetic balance," he has proved that in wires or small pieces of iron almost all peculiarities of the metal, including the existence of flaws, can be detected with ease and certainty.

His invention has been freely given to the world, but heretofore the world (as usual) has been wholly indifferent to the gift. So far as we are aware, no railway or marine engineer has taken any steps with a view to ascertain whether a similar system might not be applied to pieces of large size such as those required in actual work. Failing this, mechanical tests in a proper testing machine do not seem impossible. If the axle which broke at Penistone, before having been set to work, had been subjected to a sudden cross-breaking strain, similar to that which caused its destruction, but very much below what it should be able to support with safety, we cannot doubt that the resulting deflection or bending would have been far greater than if the axle had been sound.

What we would suggest, therefore, is that all crank axles, or other pieces of metal called to fill equally important positions, should be tested by strains similar to those brought upon them in actual work, and that their deflections under those strains should be recorded. A few experiments would be sufficient to show clearly how great this deflection should be in the case of a sound and perfect axle; and if any specimen showed a deflection decidedly higher than the limit, it should be rejected as a doubtful quality. The expense of such a system would not be great when it once became a regular part of the manufacture of an axle; and it appears to us the only method by which a single faulty specimen can be weeded out from a batch of sound and satisfactory articles.

HYDRAULIC PRESS FOR COMPRESSING WOOD. The enormous advance which has taken place in the price of boxwood, which is largely used in the manufacture of loom shuttles, has directed attention to the possibility of procuring some substitute for this now very expensive material. It has been found that various kinds of timber can by compression be made to answer the purpose, and Sir Joseph Whitworth & Co., of Manchester, have just completed a powerful hydraulic press to be used in compressing timber for loom shuttles. This press consists of a strong cast-iron top and bottom, with four steel columns and steel cylinder, with a large saw. In the center of this ram is fitted a smaller ram with a rectangular head fitting into a dye, which is placed on the top of the large ram. The timber is placed in this die, and a pressure of 14 tons per square inch is applied. The pressure is then relieved, and the large ram descends. The top pressure block, which fits the die, is then removed, and the small ram rises and pushes the timber out at the top of the die. The timber so treated is made very dense, uniform, and close grained, and will take a high finish, and it is obvious that this is a process which might be applied with advantage in the substitution of comparatively cheap timber for the more expensive work for a great number of purposes.

THE BEST LUBRICANTS.—Each kind of work has some particularity which calls for special qualities in a lubricant. Without rehearsing the peculiarities of each of various kinds of work and what the special qualities of the various lubricants, it may be noted that as a general thing, where there is extreme cold, light petroleum lubricants are best; for enormously heavy pressures and slow speeds graphite (black lead, plumbago) and soapstone; for quite heavy pressures and slow speeds, graphite, and lard, tallow, and other greases; for heavy pressures and high speeds, sperm or castor oils; light pressures and high speed, sperm, refined petroleum, olive, rape, and cotton-seed oils; on ordinary machinery, lard, tallow, heavy mineral, and heavy vegetable oils; steam cylinders, heavy mineral oils, lard and tallow (black lead is good to use here, too). Watches, steam-engine indicators, and other delicate mechanism, should have porpose jaw oil, or olive oil purified by lead plates; or sperm or neatsfoot oils, properly clarified. The only way to test a cylinder oil is by an indicator, in the cyliuder of an engine (preferably the one on which it is desired to use it), under the speeds and initial pressures of every-day use. Run the engine with some standard oil, as lard, tallow, etc., take friction cards, and load cards; then run for a day with the oil to be tested, and then commence taking cards, with the same load on as before.—*Ashley's "Useful Facts and Figures."*

THERE are 420 steam-engines and 28 locomotives at Krupp's iron and steel works, Essen, Germany.

The Future of the Steel Business.

The secret of the present stagnation in steel manufacture, according to an approved authority, is to be found in the circumstance that the power of production is equal to 100 per cent over the present demand for steel rails throughout the world. At this moment the production of steel rail mills in the world over is equal in round figures to 4,000,000 tons. Of this Great Britain can produce from 1,250,000 to 1,500,000. From ten to fifteen years ago the production of rails was only half what it is now. "For the moment, doubtless," this authority goes on to say, "a period of difficulty is before us, but there has been one good effect which will be of permanent benefit."

This benefit is the economies which the necessities of the times have demanded shall be practiced in manufacture, with the result that "rails can now be sold at a price to leave a good profit which two years ago would have left an equal loss."

The future of the trade is not hopeless. This economy in the production of steel rails is also applicable to every other article to which steel can be applied. It is a fact, marvelous as it may appear, that steel can now be produced in the market at an even lower price than that of first-class iron. With the prospect of the substitution of steel for iron in almost every article in which the latter is used, the future of the steel trade can by no means be said to be hopeless. What the past has been in the matter of decreased profits, we are afresh reminded by the secretary of the British Iron Trade Association, who shows that in the seven principal ship-building centers of Great Britain the decrease in the tonnage built in 1884 on that of 1883 was not less than 435,000 tons, or two and a half millions less trade. The quantity of iron and steel used in ship-building in 1884 is calculated at 311,000 tons less than in 1883, and allowing an average value of $40 per ton over the whole quantity consumed, the decreased business in this department done by the iron and steel trades in 1884 as compared with 1883 is estimated at $12,500,000.

WATER AND STEAM POWER IN THE UNITED STATES.—It is stated in an English paper as an interesting and highly suggestive phenomenon in the industrial progress of the United States that there is a relative decline in the amount of water-power utilized for business purposes as compared with steam-power. This tendency is all the more suggestive by reason of the fact that no other country in the world is as well endowed with natural water powers as the United States. In 1870 the census showed that there were more water-wheels in use than steam-engines, and that their horse-power was almost as much as the total horse-power of the engines. The census of 1880, however, showed more steam-engines than water-wheels, and a total power far in excess of the latter. During the four years since the census was taken, the progress of steam-power has been greater than in any other four years of the history of the United States. The reasons for the great advance of steam-power are said to be that water-power is not as reliable as it was before the forests were thinned out or cleared away, while, owing to improvements to engines and boilers, steam-power is more reliable. Severe droughts and heavy floods have also both operated to set at naught the business calculations of those dependent upon water-power, while winter frosts and floating debris contribute to the annoyance and damage. The number of steam-engines used in 1870 was 40,191; water-wheels, 51,068. Ten years later, in 1880, the number of steam-engines exceeded the water-wheels—steam-engines, 55,404; water-wheels, 50,483.

VERTICAL BOILERS.—In some way, difficult to explain, the impression seems to have gained ground in many quarters that small vertical boilers are free from those elements of danger which must be so carefully guarded against in other and larger types. Naturally, these boilers are much liked for their portability, compactness and other advantages, and the large numbers in use have probably secured for them a reputation based on purely imaginary merits. So far as we know, they are neither much better nor worse as regards safety than other boilers—worse perhaps, because too much faith is put in them, and precautions which would ordinarily be taken are neglected. However this may be, the records of boiler explosions clearly show that they require fully as much supervision and careful periodical examinations as boilers of other types, and that, as regards the number of explosions, they are very fairly represented.

STEEL.—The fact is familiar to metallurgists, that a steel which is very flexible when cold often breaks at the blue annealing temperature. It has also been generally considered that the purer the iron is, the less subject it becomes to this defect. It appears, however, that the workmen in the Ural mountains, who use iron in remarkable purity, have often observed the same fact. It has also been found on investigation that the metal in question becomes powdery at at a temperature between 500° and 700° Fahr., or the temperature at which willow twigs take fire. This phenomenon would seem to explain a large number of accidents, as, for example, the breaking of tires under the action of brakes, and the fracture of riveted molds, and of machine arbors, which become heated by friction, hitherto regarded as unaccountable.

SCIENTIFIC PROGRESS.

Who Were the Mound-Builders?

In the early settlement of this continent by Europeans, as the Indians were driven back and the primeval forests were cleared for the proper occupation of the country by civilized people, evidences were found here and there throughout the Middle and Western States that a semi civilized race must at some prior time have occupied these extensive regions. These evidences consisted of great numbers of mounds, in many of which were buried rude implements and other evidences which it has generally been supposed must have belonged to a race quite superior to the Indians which then inhabited the country. For many years much speculation has been indulged in as to who these mound-builders were.

But of late the opinion has been gaining ground that the mounds were built by the ancestors of the Indians themselves. That the mound-builders were neither Aztecs, Toltecs or any other people more civilized than the Indians. That the mound-builders were not a great and united people, but that they constituted many distinct tribes. That they were many years ago, perhaps, less roving and warlike, and more inclined to the cultivation of corn for a winter's supply of food than they were at the time of the landing of the Pilgrims. The March number of the *American Antiquarian* contains a carefully prepared article by Professor Cyrus Thomas in support of the proposition, in which the evidence adduced appears quite conclusive. A previous article on the subject by the same writer appeared in the *Antiquarian* one year ago. *Science* of May 1st contained a review of a work on "Prehistoric America," by the Marquis de Nadaillac, in which it was held that "the mound-builders were no others than the Indian tribes found in Port Columbian time, and their ancestors." The reviewer agreed in the opinion of the author. In *Science* of April 3d there is a communication from Professor J. W. Powell, of Washington, in which that distinguished scientist agrees "most heartily" with the reviewer above referred to. Professor Powell says: "There has never been presented one item of evidence that the mound-builders were a people of culture superior to that of the tribes that inhabited the valley of the Mississippi a hundred years ago. The evidence is complete that these tribes have built mounds within the historic period; and no mounds or earthworks have been discovered superior in structure or contents to those known to have been built in historic times. The theory that the country was inhabited by a people highly organized as nations, and having arts of a higher grade than those belonging to tribal society, is wild and baseless; and the fruit of that theory is nothing but exaggeration and false statement. * * * At the present time we cannot have fewer than seventy distinct peoples among the tribes of North America, and in antiquity the number may have been greater. The mound-building peoples did not constitute a distinct race. Many peoples have built mounds on this continent, and some continue to build mounds to the present day. The writer has seen a tribe of Indians erect a mound."

Theory and Practice.

Theory and practice should go hand in hand. No science can advance without theory, but no person should theorize who does not understand something about his subject. A theorist who does not know the subject on which he theorizes is like a quack doctor. Progress can only be made by trial and experiment, and no one can expect to be successful except a person who is practical enough to be able to judge of the result. Theory is nothing more than generalized practice, or the result of experience reduced to a system; or, in other words, it is the principle of correct practice, but the true distinction to be recognized between theory and practice as terms, is that practice describes a set of operations which have not been methodized and reduced to a systematic form. Theory is the name under which a class of operations is generalized and their principles enunciated, although yet it belongs to that sort of philosophical guess-work called hypothesis. No practical man can avoid theorizing if he seeks improvement, because to practice is to imitate and stop short, to go further is to theorize, but theory would be useless without practice, and it is the practical man that corrects defective theories. Experience is the foundation of all applicate science, and experience can only be gained by practice, and theory without practice is mere phantasm.

In deciding whether it is possible to accomplish a certain object a man must first theorize. He must consider whether to gain his point he will have to overcome any natural law or laws. Every sane man knows that there is a limit to human power, a line so sharply drawn that he cannot fail to see it; therefore, in working out his theory he keeps within the limits, and shapes whatever he has to work with to meet the end he has in view.

In order to get a perpetual motion a man must first be able to *create* a power. Now we all know that a man can create nothing, and when he tries he is going beyond his limit. A good mechanic may combine wood and metals and make a machine to do almost any kind of work; a chemist may unite oxygen and hydrogen and form water, but neither of them have created anything. A man can not overcome natural laws; he must work in harmony with them to accomplish whatever he does; all else is failure.

WHAT IS MIND?—Go into the chemical laboratory of your own noble university—in honor of whose founder we are here to-day—and touch the two poles of a galvanic battery. What is it that thrills through your bodies, and perhaps even burns the skin of your fingers; or, if the current be strong enough, strikes you dead on the instant? Galvanism. What is galvanism? A force. Yes, and so is light a force, and heat, and gravitation. But when I am told this I am just as far from knowing what any one of the forces is as I was before. All that you could do, if I persisted in asking for a fuller explanation, would be to tell me something of the origin and properties of the force in question, and in this way I should obtain some idea of its characteristics, and should be in no danger of mistaking it for any other force. That is what your professor of physics does for you, and if you have only profited by the instruction you have received, you have a store of facts at your command that will enable you to recognize heat, light, electricity, gravitation, magnetism, whenever you see them manifested. When, therefore, you ask me what mind is, I answer that it is a force possessing peculiar properties, and developed by a substance constituting a part of the nervous organism of man and other animals, and known to antagonists and physiologists as gray nerve tissue. This is similar in all essential respects, so far as its terms are concerned, to the definition that you would give me of any other force. Of course it can be made more precise and extensive, but no enlargement would change its character.—Dr. Hammond's address at the Lehigh University.

KILLED BY AN AEROLITE.—An apparently authentic account comes from Somerset, Pulaski county, Ky., of the death of a farmer named Julius Rohble by a meteor which fell from a clear sky on the morning of the 1st inst. The meteor was very brilliant, emitting a light described to be more dazzling than that of lightning. It struck the man's head and instantly exploded, mangling his body frightfully. His clothing was torn and burned, and his body was streaked with burning streams of molten iron or detached stones of white heat. His limbs were charred and bent out of all shape. The meteor burned itself deep in the earth and sent splinters of itself in all directions, some of which were as large as a peck measure. A witness describes the noise it made as the roaring of a dozen locomotives blowing off steam. So swiftly did it drop that the rushing sound, the flash and the explosion were almost simultaneous.

OUR INSIGNIFICANT EARTH.—It is only when we regard our globe as a member of the planetary system, and that system in turn as a unit among systems, that we realize how infinitesimal are its concerns, and how really insignificant it is. We may, for practical purposes, consider the orbit of Neptune as the circumference of our planetary system, with a diameter of about five billions of miles. But if we could suppose this vast area converted into a solid globe, instead of being empty space as now, and given a highly luminous surface, it would appear to an observer upon the very nearest fixed star no larger than a half-dollar piece at a distance of some 200 feet from a human eye.

A WONDERFUL TRANSFORMATION.—A tadpole, the larva of a frog, has a tail and no legs, gills instead of lungs, a heart precisely like that of a fish, a horny beak for eating vegetable food, and a spiral intestine to digest it. As it matures its hinder legs show themselves, then the front pair; the beak falls off; the tails and gills waste away; the lungs are created; the digestive apparatus is changed to suit the animal diet; the heart is altered to the reptilian type by the addition of another auricle; in fact, skin, muscles, nerves, bones and blood-vessels vanish, being absorbed atom by atom, and a new set is substituted.

AN INCIDENT OF A LATE STORM.—The Marysville *Appeal* relates a curious incident connected with the April showers on Thursday the 9th inst. which took place on the Marcuse ranch, near the Nicolaus road in Sutter county. A man engaged in plowing about 100 yards from the road was thoroughly drenched by a heavy shower of rain before he could unhitch his team and get under shelter, while on the opposite side of the road not a bit of rain fell. Parties on the opposite side of the road witnessed the plowman's discomfiture without themselves receiving a drop of the moisture.

NEW SPECIES.—Surprise has often been expressed at the fact that no new species of animals seems to have appeared since the glacial age. Donald Mackintosh, writing in the *Geological Magazine*, advances an explanation of this, the new theory, which appears to be growing, that only a few thousand years had elapsed since the glacial beds were laid down.

RIGHT-HANDEDNESS.—It has been observed that "right-handedness" extends far down in the scale of creation. Parrots take hold of their food in their right foot by preference, and Mr. Crookes is inclined to believe that insects like wasps, beetles and spiders use the right anterior foot most frequently.

MINING AND SCIENTIFIC PRESS.

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A. T. DEWEY. W. B. EWER. G. H. STRONG

SAN FRANCISCO:

Saturday Morning, May 2, 1885.

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Passing Events.

The latest news over the wires indicates that the looked for war between England and Russia is only a question of a few days. In the event of war people in this State look for high prices for their products.

The proposed convention of mine-owners in opposition to the Miners' Union, at Wood River, Idaho, will be looked to with interest all over the Coast, as questions will come up there that will be of moment in all mining camps.

The spring is now so far advanced that prospectors have come out of winter quarters and are roaming over the hills again. We may shortly look for news of new finds in several parts of the Coast, where a good many miners have congregated in their search for new mining grounds.

In three years the price of copper has fallen off 20 per cent, and as it is being found in many places in large quantities it is not likely there will be a permanent revival in prices. But by these discoveries the uses of copper will be greatly multiplied, and in the future it will enter into many manufactures out of which its high cost hitherto has kept it.

About as much excitement exists this year at Coeur d'Alene as last. All the claims taken last year are being looked after, and active preparations are making for opening a vast amount of the new ground. A 3,000-inch water ditch is being built.

Mining Superintendents.

In the palmy days of mining in Nevada and California there was a certain class of mining superintendents employed at big salaries, whose duties were exceedingly light, and who established reputations for themselves entirely upon the work accomplished by those under them. This was notably the case on the Comstock, where there were superintendents who entertained visitors, looked after bullion, drove fancy teams, gave good dinners and "did the grand," while their knowledge of mining and metallurgy was in inverse proportion to their self-importance. These men cut a fine figure while money was plenty, assessments were paid promptly, and big works were being put up. Their responsibilities were small. They knew more about the stock market than they did about mines, and simply obeyed orders from headquarters where stocks were being manipulated. With good men supervising mine and mill, they went on swimmingly and really had a fine time of it; and the system lasted much longer than one would have supposed possible.

But the time came when the mines paid less; the people paid assesments grudgingly; the stock market attracted less attention, and the mines had to be worked on a less top-heavy system. Then the kid-glove superintendent had to go. His time was up. Knowledge of mining and milling became more necessary than the entertainment of visitors or the maintenance of "style." When it came to be required that practical work had to be accomplished with less expenditure, a different class of men came to the front. Those who gained their knowledge in underground workings, or near the pounding of the stamps, were more sought for. Men of executive ability who knew how to handle men to the best advantage, and knew the proper course to pursue to prospect and develop any given section of a mine were in demand. And it is this class of men who to-day are generally in charge of our best mines, while the "gentlemanly superintendents" of ten or fifteen years ago have "taken a back seat."

It is true, salaries are not so high as formerly, and duties are more onerous; while at the same time the grade of intelligence in mining matters has been raised. Trained and skilled men have displaced the mere ornamental figure-heads, who spent money with a lavish hand, secure in the feeling that it did not come out of their own pockets. It must be acknowledged, of course, that there were good men in the old days, as there are poor ones now; but, generally speaking, there has been a decided improvement of late years in the intelligence and scientific and practical knowledge of mining superintendents. Men having special knowledge of milling, smelting, concentrating, leaching, etc., are to be more readily found than was the case years ago; and in all matters concerning the development of mines there is more experience. The old-time superintendent cut more of a figure in the world than the manager of the present, but in practical results he was far behind his modern successor.

Mine Pointers.

Custom reduction works ought to be more plentiful than they are. There are throughout the country very many claims that are still mere prospects, for the reason that the owners cannot get their ores crushed and they have not got the means to develop their claims without some return.

When a superintendent strikes good ore in a small shaft in a mine he is opening it is by no means necessary to run off half a mile or more to locate a tunnel which shall tap the vein several hundred feet down. Better stick to the ore in the shaft and see if the mine develops. A good many men seem to think a tunnel site a necessary adjunct to every mine. There have been many mining operations which have proved unprofitable because too much time and money were expended on tunnel work, when they could have been developed just as well by the original shafts.

Dig is better than talk. The man who works at his claim and develops it will accomplish something more than he who simply blows about what it will be when developed. Miners can afford to leave the talking to that class of men who bond mines in hope of selling them without having to do any work.

In the contemplated purchase of mines, hereafter, it is probable there will be a more searching examination of the properties themselves before purchasing and a closer inspection of the peculiar conditions under which work must be carried on afterward. Next, rigid business application to matters of detail in the mining, marketing or reduction of ore, because properties will be sought for permanent operation at the hands of the purchasers themselves.

The demand for more custom concentrators in camps at a distance from reduction points is one that is bound to be met in time. Properly managed such works pay and are of the greatest benefit to the working miner. By their means he can realize quickly on the ore he gets out.

One of the curious tendencies of mine investors is thus satirically referred to by a writer in speaking of mines of Tuolumne county in this State: "What a dire misfortune it is that the facilities for working mines are so admirable! Here we have an abundance of good water for all purposes, with wood in endless quantities. If this were a desert tract of land, almost inaccessible, with fuel not obtainable, and water, even for drinking purposes an entire stranger, what a boom the strikes of the past four months would have caused!"

Air in Mines.

In the working of coal mines it is not only necessary to have an active and regular current of pure air, but the speed and volume of this must be regulated by the number of miners, the extent of the workings and the natural emanations of the mine. Very rapid air currents have been found to be dangerous, as they produce vacillation of the flame of the lamps. The measures against dangerous speeds of air current are only, of course, necessary in drivings and shafts where over.

The French Fire-damp Commission in their very elaborate report of recent date, recommend certain precautions which only differ from the English regulations in the special recommendations made with respect to dangerous speeds, recommendations which are found, in principle at any rate, in the most recent Belgian regulations.

In some special regulations of England and France it is forbidden to stop the fan, except on days when no working is carried on under ground.

The stoppage of the fan during the course of the day, at meal hours or during the change of shifts, to permit of oiling, for instance, is a practice which may cause danger, and which has occasioned accidents. The stoppage of the fan on days when no working is carried on permits of ascertaining, during the inspection preceding the resumption of work, which are the most gassy working places, and to what extent they are so.

The number of hours during which the fan should be kept going before the descent of the men naturally varies with the special conditions of each colliery, according to the abundance of the disengagement of fire-damp, the volume, and the speed of the air which is made to circulate.

It is not possible to lay down precise rules as to the quantity of fresh air that should be made to pass through a colliery; that depends, not only on its output but also on the greater or less amount of fire-damp that is evolved. As a guide, the rule generally admitted in Belgium may be mentioned, which gives 30 to 50 litres (1 cubic foot 103 cubic inches to 1 cubic foot 1,323 cubic inches) per miner, or 30 to 40 litres (1 cubic foot 103 inches to 1 cubic foot 713 cubic inches) per ton of coal extracted. It is understood that these quantities relate to those which pass really and effectively through the working places—that is to say, with the deduction made of all the losses which the air arriving at the bottom of the downcast shaft may sustain. These Belgian data do not differ greatly from those given by the French administration of mines—that is to say, 50 to 100 litres (under 2 to 4 cubic feet) per ton extracted, this figure being intended especially for the total volume of air exhausted. In fine, what is important in a given working place is to have the quantity of air necessary to prevent the fire-damp from being appreciable, without, however, the speed exceeding 2 metres (6 feet 6 inches) or at most 2½ metres (8 feet 2 inches). In return air-ways, where the men do not circulate as a rule, and where the speed may sometimes be greater, measures should be taken to prevent the quantity of fire-damp from attaining 2 per cent or 3 per cent, a proportion which is enormous, and even dangerous.

Copper.

There does not appear to be any very hopeful feeling among copper miners of any permanent improvement in the price of copper. It is true that more uses are being found for the metal—that is, it is being used for purposes which with former ruling prices would have been impracticable—but the product is now so very large that to find a market at all it must be sold very low. Some of the largest mines in this country have been working at a loss, and others may have to shut down altogether.

We look to the English market as the regulator of prices, and in the month of March there was an important fall in Chili bars, amounting to £2 2s 6d per ton. Previously £47 had been the lowest price on record; but on the 1st instant there were sellers of cash bare in Liverpool at £45 per ton, though 10s advance has since been paid on account of improved deliveries and moderate charters. This decline was caused partly by the fear of war with Russia, in connection with the delimitation of the Afghan frontier, but more especially by the announcement of a further large contract for Anaconda matte having been concluded with eight of the English smelters on terms slightly better than those of the previous contract, but still at a price comparatively much lower than is being paid for other furnace material, and very favorable to the purchasers, enabling them to sell English and manufactured copper at very cheap rates. As the price is fixed upon that ruling for best selected at the time of arrival of the matte, the lower prices accepted for English copper makes that paid for the matte all the lower.

James Lewie & Son's, Liverpool, report on ores and metals states that the quantity contracted for is a minimum of 10,000 tons or a maximum of 15,000 tons fine at sellers' option, delivery being spread over the rest of the year. 1,000 tons fine have also been sold to American smelters. The maximum quantity, together with that previously contracted for, will make the total production this year from the Anaconda mine about 20,000 tons fine, or nearly equal to the whole product of Montana last year. This does not look like any falling off in the supplies from this district during 1885.

The balance sheets of the four largest Lake Superior mining companies, after the Calumet and Hecla, with a total product of 8,380 tons (2,000 lbs.), have been published, and it appears from them that the cost of production varied from 10.95 to 11½ cents ₱ lb. As retail sales of this copper are being made at 11 cents, and the price under the contract is considerably below this, it would appear that Lake Superior copper cannot at present be produced to a profit.

In Liverpool in March there arrived 650 tons of Japanese copper which competes with English, Australian, Chili and American ingots. A considerable portion of the Montana matte now arriving in Liverpool was sold some time ago for forward delivery at 105 up to 105 9d per unit. The price now being realized for that sold on the basis of "best selected" is only about 85 per unit—a great difference. The arrivals from the United States for the month of March equaled 1583 tons of fine copper, and those from Chili were 2,860 tons. Chili exports for the first quarter of the year aggregate 13,186 tons fine. The stocks on hand are 28,290 tons fine in Liverpool and Swansea. Taking that from other countries, the total visible supply is 53,504 tons.

A table showing the imports into Liverpool and Swansea, compiled by James Lewis & Sons, will give miners in this country an idea of where all the copper comes from. It covers the imports into the two places mentioned, those to London being omitted. Of course the French imports are omitted also. The table is as follows and is figured in tons fine for the first three months of each of the years mentioned:

	1882	1883	1884	1885
From Chili	6,832	7,807	8,137	7,072
From United States	100	787	2,796	4,911
From Canada	66	108	160	
From Mexico	32	156	—	40
From Peru	656	198	173	15
From River Plate	54	120	40	26
From New Quebrada	504	876	1,084	1,270
From Newfoundland	140	—	—	72
From Spain	47	145	570	1,282
From Portugal	—	19	36	5
From Italy	425	151	149	169
From Norway	—	—	45	—
From Cape Good Hope	1,228	1,416	1,864	700
From Australia	45	32	171	141
From Sundries	81	122	59	44
Precipitate	2,676	3,038	2,873	2,167
	13,336	14,975	18,157	17,914

New Mexico.

Fleming Mining District.

[Written for the Press by our Traveling Correspondent.]

Eight miles nearly due west from Silver City is this now well-known mining camp. The place is small but prosperous. The richness of the developed mines have given an impetus to development by small property-owners and prospectors, hence the general activity in mines in the immediate vicinity. The readers of the Press have often seen a mention of the celebrated Old Man mine. A description of this noted property will give mining men an idea of the formations, ores and methods of mining in this district.

The Old Man Mine.

Few mines in New Mexico have excelled this as a bullion producer in the same length of time. Less than 1,000 feet of shafts, inclines and tunnels, dead work included, has been done on the mine, and out of this $120,000 has been taken from the high-grade ores, and on the dump over 15,000 tons of low-grade that will average nearly $20 per ton awaits treatment. The formation is a contact between limo and shale. The ore body being quartz about 14 feet in width, carrying rich deposits of chloride and horn silver near the shale; the balance of the quartz being a low-grade.

A Model Property.

A two-compartment incline handsomely timbered follows the hanging wall down to the depth of nearly 200 feet. A number of drifts and tunnels have been driven in both ways from the incline, and rich deposits near the shale has been the order of progress under ground. Ore chambers have been stoped out and the bulk of the low-grade ores uncovered and can be speedily and cheaply extracted in the future. The latest and most practicable machinery, an economical and experienced management and an inexhaustible supply of excellent ore make the Old Man a model mine.

Mining on a Business Basis.

There are but few stock mines in the Territory that are conducted on the same business principles as this; in fact too much caution and not enough venture and push, considering the showing, is the motto of the company. The president and general manager, J. T. Seldomridge, has managed to pay for the purchase of the mine and distribute $39,684 in dividends in less than eight months. This has been accomplished with a force of 50 men and only high-grade ore shipped, the low-grade being held for treatment by a mill to be erected when the money can be spared from dividends and a lasting supply of ore is obtained.

Western Capital.

The Old Man is owned mostly by Colorado people, the principal owners residing in Colorado Springs, Colo. The cautious, business-like method of the manager is holding back the rapid and extensive development of the property. Notwithstanding a recent rich strike the work goes on in the same cautious manner. The ore on the dump would pay for the erection of a mill, and the ore bodies exposed in the mine will keep a good-sized mill going night and day for some time to come. General manager, Seldomridge, who owns the most of the mine, is somewhat of an invalid, and unless he is bought out or retired from the management the mine will continue to pay regularly as heretofore, but will not be opened up like a mine with the Old Man's showing should be.

The Treasury Mountain Group.

While the Old Man has attracted wide-spread attention by its rich deposits and heavy ore shipments, the group owned by the Treasury Mountain Company adjoining the Old Man on the east, bids fair to rival it in the near future. The location of these mines dates a short time previous to the discovery of the Old Man. The vein is a continuation of the Old Man, and the croppings across the face of the claims in places have yielded rich deposits of a very high-grade ore.

Development.

No earnest work of development had been done on any of the groups until during the past six months. Philadelphia people own the mines, and notwithstanding the reputation of the Quaker capitalists for sending out "the wrong man for the right place," they have secured the services of W. C. Hadley, a thorough mining man—not an office figure-head, but a practical mining and business man. In twelve openings on the vein ore has has been exposed. On the seven thirty-seven directly adjoining the Old Man a shaft 130 feet deep opens up a 12-foot vein of quartz the greater part of which is silver-bearing. Hoisting works will be erected on this mine. The Twin Sisters show ore, a number of tons on the dump being of a high grade. Work will be pushed extensively this season and excellent reports can be looked for from Superintendent Hadley's work. A diamond drill is kept busy at work locating in advance of the vein as it is opened up.

Concentratee.

Water is not scarce.

Wood is cheap.

Miners' wages are $3 and $3.50 per day.

Freight ratee on ore by teams to Silver City is $4.50, thence to Socorro $6, making $10.50 for both wagon and rail.

There is but little night work or sabbath labor in the camp.

There is very little ground about the hills that is not located.

The purchase of mining interests in this vicinity is a frequent occurrence.

The Silver Brick near town is taking out 28 oz. ore.

Joe MacDonald, a well-known and deservedly popular Colorado mining superintendent, is directing the workings of the Old Man mine.

The newly revised mining laws of the Territory, requiring a certain amount of work done inside of 90 days on all claims located, has opened up many a good prospect in Grant county.

A recent shipment of Old Man ore, weighing 1,148 pounds, returned the snug sum of $1,386.70.

Colorado capitalists appear to have an eye on New Mexico; a number of Colorado Springs business men own the Old Man mine.

The shipping ores of the Treasury Mountain Company's mines and the Old Man average $300 per ton.

The Caribou, a promising mine, has been allowed to fill with water, and is at present in a condition that would indicate a freeze-out, or a desire to purchase the property at a low figure by some one who knows its value.

A late strike in the Old Man has caused brisk work among prospectors.

There is little or no base metal in the ores of Fleming district. F. W. S.

Humid Assay of Silver Bullion.

From C. H. Aaron's work on "Assaying," parts II and III (just issued by Dewey & Co., 252 Market street, S. F.), we make the following extracts on the subject of the humid assay of silver bullion:

Owing to the uncertainty attending the fire assay of silver bullion, the humid method is used in all United States mints and first-class private offices. This method depends on the fact that

Standardizing Solution for Silver Assay.

silver in nitric acid solution is completely precipated in the form of chloride by a solution of common salt. At the same time the salt is decomposed, so that if suitable proportions of silver and salt be thus brought together neither can afterward be found in the liquid.

In the Royal Mint, in India, the precipitated silver chloride is dried and weighed, and from its weight that of the pure silver is calculated. In this country and in Europe the quantity of silver in the solution is estimated by the quantity of salt solution of known strength requisite for its precipitation. The salt solution is either weighed or measured. The latter method is the most general, and is called the *volumetric* assay.

Standardizing the Normal Solution.

A thousand of pure silver is dissolved in about 10 grammes of nitric acid of about 32 degrees Beaume in a bottle of clear glass, which will contain about 200 c. c. To facilitate action the bottle is placed in a vessel containing warm water. When the silver is dissolved the red fume which fills the bottle is blown out by means of an inserted glass tube, so bent as that the workman's face may not be over the bottle while blowing. As soon as the assay has cooled 100 c. c. of normal solution are added by means of the pipette and the bottle is put into a Japanese tin case or enveloped in a cloth to prevent the action of the daylight on the silver chloride which might slightly vitiate the result, and the stopper previously dipped in pure water is put in.

The bottle held, as shown in the diagram, is briskly shaken for several minutes, which causes the precipitate to curdle and settle rapidly, leaving the liquid perfectly clear. On placing the bottle on the table to allow of the settling, a brisk to and fro movement is given to it, so as to wash down from the sides any adhering chloride.

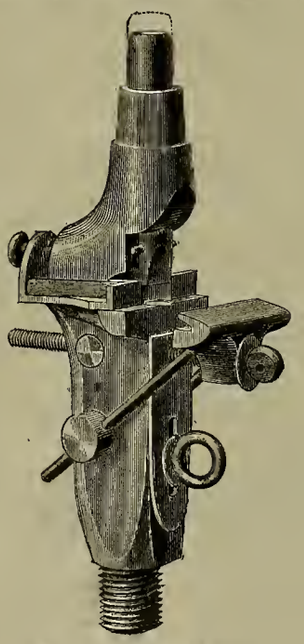
When the liquid is quite clear the stopper is removed and suspended in a clamp or bracket, so that the moisture part may touch nothing. A c. c. of decime salt solution is poured into the bottle. If, immediately or after a few seconds, a cloudiness is perceptible in the liquid, it is evident that the normal solution is weak, because 100 c. c. of it have not precipitated 1,000 of silver. The liquid must be again cleared by shaking, and another c. c. of decime salt solution added, and so on until no further cloud is produced.

A record of the number of c. c. decime solution used is kept, but the last one is not counted, because it produced no effect, and the one before the last was probably not required, so it is counted as half. Supposing that 7 c. c. caused precipitation, but the 8th did not, only 6½ must be counted. It now appears as though 1,006½ points of silver had been present in its solution, but it is known that there were but 1,000, because that was weighed; the normal solution is therefore 6½ points weak, and requires a corresponding addition of salt. The rules for quantity of salt and of water here follow in Mr. Aaron's book.

Kopf's Saw-Set.

Wilhelm Kopf, of Santa Rosa, Sonoma county, has just patented, through the Mining and Scientific Press Patent Agency, an improved saw-set adapted for even and correct work, and capable of setting the teeth of the saw at any desired angle.

The frame of the saw-set consists of a vertical piece having on one face a transverse groove or



Kopf's Improved Saw-Set.

recess, in the lower wall of which the die is set. The hammer, consisting of a suitable bar, passes through the top of the frame and extends downward into the groove or recess directly over the die and its lower end is properly beveled, as shown in the illustration, to adapt it to strike the saw-teeth. A spring around the hammer within its seat is the means by which it is returned.

There is a guide consisting of a bar, the forward ends of which are bent parallel with the length of the recess or groove. This guide is adapted to move back and forth by means of the set-screw shown at the rear of the device, which passes through its back into the frame. The object of this guide is to regulate the distance to which the teeth of any saw are to be inserted in the recess upon the die, and this is accomplished by reason of the teeth of the saw coming in contact with the bent and parallel ends of the guide, whereby the tooth about to be operated upon, is limited and adjusted in its position under the hammer. By properly adjusting this guide it is adapted to limit the teeth of various lengths.

In order to provide a rest for the blade of the saw, while its teeth are being operated upon by the hammer, the inventor has a bench or rest consisting of a strip or bar lying outside of and parallel with the recess or groove in the frame. This bench or rest is shown in front of the device, and it is necessary that it should have two adjustments—one away from or toward the die, whereby saw-blades of different widths may be accommodated, and another vertically, whereby the said blade may be set at any angle with the horizontal plane of the die, so that the teeth resting thereon shall be at such an angle as to enable the hammer to set them as desired. To accomplish the first of these adjustments there is provided a screw (shown in the engraving, projecting to the rear, with suitable turning hole in front) which passes through the bench or rest and through the frame. In its course through the frame it passes through a nut formed on a pin or bolt which is adapted to rock in its bearing for the purpose of allowing the second adjustment of the bench. By operating the screw through the nut the bench or rest may be adjusted closer to the die, whereby it is adapted to receive a narrow blade, or away from the die to admit a wider blade.

The second adjustment—the vertical—is accomplished as follows: It is necessary to support the bench or rest by means of suitable braces; but it is obvious that these braces cannot be fixed, but must have a movement to provide for the movement of the bench. Accordingly the implement has arms or supports (shown on the side of the frame) secured at each end of the bench or rest, and thence passing diagonally downward and loosely through the projecting ends of a pin or bolt, adapted to oscillate on its bearing.

Now it will be seen that the bench or rest may be forced downward, turning upon its main pivotal bolt or pin, and its movement being permitted by the arms moving back and forth through the pin or bolt shown on the side of the frame, which, by oscillating in its own seat, allows the movement of the bench or rest. Therefore, after setting the bench at any desired distance from the die, it can then be moved up or down to any angle with the horizontal plane of the die or groove, so that the tooth may be set at a suitable angle.

There must be, however, some means for holding the bench to the position adjusted, and to accomplish this a plate is provided, lying on the face of the frame, and having an elongated slot in its lower end, through which a set-screw passes. The slotted plate and set-screw are shown on the front of the frame, under the bench or rest. The upper end of this plate is mounted loosely upon the adjusting screw, which accomplishes the horizontal adjustment of the rest before described. When the set-screw of the slotted plate is loosened by turning the ring shown, the slotted plate is adapted to move up or down with the adjusting screw, as it is moved through its arc by the bench or rest; but when the set-screw is tightened, then the slotted plate becomes fixed and the horizontal adjusting screw of the bench or rest cannot be moved, and consequently is fixed in its position.

The saw is laid upon the bench or rest and its teeth adjusted up to the ends of the guide, so that one of the teeth is inserted in the recess over the die, and is adapted to be struck by the descending hammer; provision is also made for very narrow blades by making a slot or groove in the face of the rest, in which the rear edge of the narrow-blade saw is inserted and is thereby supported and guided while its teeth are being set. For further information concerning this implement, the inventor can be addressed as above.

Sierra County Mines.—From a private letter we learn that the Bald Mountain Extension claim, at Forest City, cleaned up last Monday for six days' work 129 ounces 15 pennyweights of gold; the Bald Mountain mine cleaned up 276 ounces. One nugget in the Extension sluice weighed 4½ ounces. The Extension lead is growing richer and as yet no south-west rim to the channel has been found. At Downieville the arastra clean-up last week at the Oro quartz mine for a six weeks' run was $1,300. There is an abundance of good paying quartz being found, and already the stock of this promising ledge is rising in value. There was a 10-stamp mill at the Oro in early days, and the mine at that time yielded princely returns. The chances are now that it may do so again in the future.

The Ontario, Utah, has made a twelve months' successful and continuous run, and will be shut down this month for a clean-up.

Improving a Harbor by Hydraulicing.

Digging Out a Bar with a Jet of Water.

The following article we take from the New York *Sun* of April 10: When Gen. John Newton and the United States engineers were trying to get rid of the Dimond Reef, near Governor's Island, in the autumn of 1878, it was tough work to remove the indurated clay and boulders. They got rid of all the rock near the surface, but when it had been cleared away to a depth of nineteen feet the work became so difficult that they were almost ready to abandon it. They were working for a 26-foot channel, but the boulders stuck fast in the clay and only a drill and blast could dislodge them.

Gen. Roy Stone, who commanded the Bucktail Brigade during the war, was one of those who were watching the work. He saw how slowly it was going on, and remembering the rapidity with which a jet of water tears away rocks and soil in the operations of hydraulic mining, he concluded that it would do the same thing under water on the Dimond Reef. The majority of the engineers held that this plan would not work because the water over the reef, as they thought, would neutralize the effect of the jet. One of them suggested that a sand-blast would do better. Still, the stream of water was worth trying, and Gen. Newton permitted the experiment. A hose was rigged to a powerful force-pump, and Tom Conkling, an old diver who had worked at reefs for over a score of years, put on his diving suit, took the hose, and went down nineteen feet to the reef.

"It's no use trying," he said before he sank.

When he got to the bottom he strapped the hose to his waist and held the nozzle firmly between his knees, with the end pointed beyond his toes. He pulled the signal string once, and the water was turned on. In less than a minute came two violent jerks, and then three rapid yanks. That meant to shut off the water and hoist him up. Panting and pale, Tom Conkling took off his helmet, and said:

"It'll work. It'll work, General. If you hadn't turned the water off I'd have been in China by this time."

The water jet had bored a hole in the reef directly under Tom's feet, and he had sunk to his waist before the water was turned off.

Everybody was convinced. A regular hydraulic jet machine was rigged up, and the clay was washed out, and the boulders were taken up by grappling irons till the channel was 26 feet deep. Gen. Stone perfected his invention, and last year it was patented.

Of the three ship channels through the Lower Bay Gedney's is probably used by more vessels than both of the other two together. It would be used by all, including the largest, if there were enough water over the bar. To accommodate modern commerce there should be at least 30 feet of water in the channel, but there is not more than 26 or 27 at ordinary high water. That is why the Chamber of Commerce has stigmatized New York as a second-class port.

In the River and Harbor bill of the last Congress $200,000 was appropriated for the surveying and deepening of Gedney's channel. Thereupon, Col. Gillespie, of the engineers, made preliminary surveys and proposals were advertised for. Gen. Stone having perfected his plans, bid $180,000 and got the contract two months ago. It provides that a channel 480 feet wide shall be cut through the bar, so as to give a depth of 28 feet at low water.

On Feb. 15th Gen. Stone began work on his plowing apparatus. Soundings showed that the bottom of the channel was hard sand, packed so firmly that it was not easy to sink a tube in it to get specimens. He chartered the powerful tug Osceola and had it refitted at the Delamater iron-works. Four pumping-engines of a capacity of 1,200 gallons a minute each were put in, besides a hoisting apparatus and three big electric lights.

On each side of the boat was placed a big iron pipe connected by a shoulder joint to the pumps. The pipes were 52 feet long and ten inches external diameter. At the lower ends they were curved forward and ended in two nozzles, one of which pointed upward at an angle of about 45 degrees and was 2½ inches in diameter, and the other opened directly in front with a slight downward inclination, and was 1¼ inches long and half an inch wide. At a pressure of 100 pounds to the square inch the pumps will send 4,800 gallons of water through the four orifices in the ends of the two iron pipes at a speed of 7,000 feet a minute. The action of the water is continuous, as the pumps are in double gangs and the stroke alternates.

A few weeks ago Gen. Stone put his machine in operation, and after a few trials and some slight changes in the machinery it has begun again, and in earnest, to scour and plow out Gedney's channel. The boat went out yesterday morning from the cove at Sandy Hook about 7 o'clock and steamed over to the north side of the bar. Then the hydraulic plows were lowered and the pumps began to work. The horizontal water jets drilled a path through the tough sand, and the upper jet blew the sand to the surface of the hay and scattered it. The ebb tide carried the sand out to sea at the rate of one and a half miles an hour. Particles of sand could be seen suspended in the foam and froth above the nozzles of the pipes. When the Osceola had crossed the bar, which is 4,000 feet wide there, the water plows were raised, and the tug went back to repeat the operation, working always with the ebb tide. It was just like ditching with a double subsoil plow. If the ground was dusty and the plow threw the dust and dirt into the air while the wind was blowing, the comparison would be complete.

Soundings yesterday showed an increase in depth of from 8½ inches to 2½ feet wherever the plows had been at work. Yesterday morning seven double furrows, each five feet wide, were cut in two hours. When the weather is favorable it is proposed to plow ten hours a day, five during ebb tide. There have been about 150 double furrows plowed so far. At the present rate it is believed that a channel 200 feet wide and 28 feet deep will be cut by June 1st; and there is apparently no reason why the operations should not be extended until a channel 480 feet wide and 30 feet deep at low water is secured. The work has so far been more successful than was expected.

"It is only a question now," said Gen. Stone, "of how many times the bar must be plowed over. That depends on how far the sand moves each time and how quick the tide will carry it away. Ocean steamers are aiding us. When the hard crust is once broken their screws stir up the soft sand beneath and it floats away with the tide. We are getting along faster than the soundings show, for packed sand increases in bulk when it is stirred up, and the first result of the plowing was expected to raise the bottom just as plowing a field raises the surface. Twenty-five per cent increase of bulk is always allowed for that. I have notified the Pilot Commissioners that the best water and softest bottom is where we are at work, and they can aid us by bringing the big steamers over our freshly plowed bottom. We have found dumpings from mud scows in the channel."

Working Manganese Deposits.

In a paper read before the North of England Institute of Engineers on the manganese deposits of the islet of San Pietro, Sardinia, Profcssor Leboni said:

San Pietro is a small island to the south-west of Sardinia, with an excellent harbor—Carlo Forte—on its eastern coast, six miles from Port Scuco, on the south-western Sardinian coast. The manganese mine is on the western coast, and consists of two concessions—Capo Rosso and Capo Becco—and of two "permissions of rescarch," the whole covering nearly 2,000 acres. The seam of manganese ore (black to brown) is of an average thickness of 1 foot, lying on a bed of soft whitish clay, containing fragments of trachyte, and forming the floor of the deposit; above it is some 4ft. 6 in. of jasper, above which again comes trachyte of various colors and qualities. The percentage of manganese in the best portions of the mine will be from 31 to 35 per cent, and the ore will contain from 7 to 13 per cent of iron. The second quality will contain about 20 per cent of manganese, and about 14 per cent of iron. In the more manganesiferous portions of the ore there is a considerable quantity of free silica, which must render this portion of the bed, to a great extent, inadaptable to the manufacture of ferromanganese. Manganese being scattered through the tufa, its presence as a crystalline peroxide in fissures in the trachyte is readily accounted for.

The mode of working is to drive cross-cuts from the gallery in the direction of the strike; a rise is then put up from this cross level through the bed; small beds four to four and a half feet high, and kept open by good timber at the sides and top, are next driven towards the rise of the bed. The men first hole into the soft clay floor with a somewhat curved pick, having a hammer-head prolonged some inches beyond the handle. The clay, which they constantly throw behind them, forms the *remblai* with which the old workings are filled up. The manganese is afterward brought down by sledge-hammer and long thick wedges. The ventilation is somewhat sluggish, and the temperature abnormally high, and although the mine is above sea level, the men work bare to the waist, even in winter. There is a large portion of water (20 per cent and upward) in some of the qualities as sent to market, which shows that some means of drying it should be adopted at the mine. A good round sum has been spent in attempting to solidify the ore by forming it into bricks, but as yet no satisfactory result has been obtained. The mine is cheap to work, or else it would have been useless to go on with any show of success, when so often, too, the bed contains on an average only 30 per cent of manganese. It can be delivered at about 16s. per ton f.o.b. at Carlo Forte, and in the year 1881 4,895 tons were raised, at a value of £6,600; and in round numbers 44,000 tons have been raised in all, realizing £57,700, giving an average value of 26s. 2d. per ton.

CŒUR D'ALENES.—Large numbers of men are heading toward the Cœur d'Alene mines in Idaho, and it is expected that fully 15,000 miners will go into the camp the present spring and summer. There is plenty of snow on the ground yet, and in several places it is two feet deep on the level. Discoveries recently made on the divide at the head of Dream gulch warrant the belief that the ridges on both sides of Prichard creek are veined with auriferous quartz. A 15-ounce nugget was taken from Yankee Boy claim, near Murry, by Ed. Kahler. It was taken to Portland, and assayed $192.50. Several five and six ounce nuggets were taken out, and many of less weight.

Wire Ropes for Hoisting.

The following remarks taken from a paper recently read by Mr. R. I. Frechville, H. M. Inspector of Mines for Cornwall, will prove interesting to miners:

Of all mining operations none is more important than that of winding, or has undergone more changes or improvements during the last quarter of a century, especially in the coal fields, where, in consequence of the increased depth and enormous output of the mines, great attention has been bestowed on this branch of mining engineering. In some instances from 1,000 to 1,500 tons of coal are drawn from a single pit in a day, the cages running at a speed in the shaft of from 1,500 to 2,000 feet per minute. The result is due not only to the shafts being perpendicular and powerful engines being employed, but also to the marked improvement of detail in the appliances used.

The rope to be used is a matter of the first importance, especially in those cases where the security of human life is dependent on its efficiency. The essentials of a good rope are flexibility and strength, combined with the least possible weight. Experience has shown that in the majority of cases these requirements are best fulfilled by round steel-wire ropes. Iron-wire ropes are fast going out of use, owing to the larger sizes required for given strengths, with consequent increase of dead weight to be subtracted from the useful load. It must, however, be borne in mind that where the water contains much acid, the injurious effect of this on a steel-wire rope would be greater than on an iron-wire rope.

The softer kinds of steel approached wrought-iron in character, bearing equal toughness, greater strength and the same capacity for welding. The following are the breaking strains for a square inch of some of the most usual varieties employed in rope-making:

Mild steel	from 40 to 50 tons
Best crucible steel	50 to 60 tons
" patent "	70 to 80 tons
" plow "	110 to 120 tons

Too great stress cannot be laid upon the necessity of having ropes constructed of the best material. The selection of the material, however, somewhat depends on the conditions of working. Thus, with a perpendicular shaft and large drums and pulleys, a plow-steel wire rope will be found the most reliable; but with small drums and pulleys, and a shaft with angles in it, a rope made of best patent steel or mild steel will last longer, as the wires are not so apt to snap in bending. In describing a wire rope, the number of strands, the number of wires in each strand, their gauge, the quality of metal, and the material of which the center or core is composed, should be specified.

Now as to the gauge, since the ultimate strength of wire increases as its diameter decreases, and since small wires are more pliable than large ones, it would seem that the finer the wire used the better; but there is a practical limit to this, as very fine wire offers too much surface to oxidation, and is too easily injured by friction. Experience has shown that it is advisable to employ medium-sized wires, between Nos. 10 and 15 of the Birmingham wire gauge. For ordinary work hemp cores or centers have been proved the best; they stretch with the strands, allow the wires to bed themselves solidly, and give ropes greater flexibility than could be obtained with wire centers. The latter have not given very satisfactory results in practice, although a greater breaking strain is obtained with a relatively smaller rope.

There are many modifications in the methods of laying or twisting the wires. Common laid rope has 6 strands with 7 wires in each, the size of the wire being altered to suit the size of the rope. Compound ropes—that is, ropes with more wires in the strands than in the usual construction, in addition to other varieties, have 6 strands with 19 equal-sized wires in each, or 7 strands with 6 wires in the middle of about 15 gauge, and 12 round the outside, alternately 15 gauge and 12. Ropes with 6 strands of 11, 12 and 13 wires each are frequently manufactured. Some makers prefer inner wires of each strand smaller, so as to be more flexible than the outer. Six strands in a rope are better than 4 or 5, as they make it more cylindrical, and consequently the friction is better distributed. Six strands of 19 wires each make very durable ropes. These work better than one of equal size composed of 6 or 7 wires in a strand, as the latter, being larger and less pliable, are more liable to snap in passing round pulleys and drums. When 3 or 4 of these wires break near together the rope is hardly fit for work, whereas the breakage of small wires would be of much less consequence. More material can be got into the same sized rope when compound instead of common laid, as the smaller wires do not leave so much space between each other.

THE Brotherhood of Locomotive Engineers was orgainized in Marshall, Mich., nearly twenty-four years ago. It has now more than 16,000 members; and has paid over $1,200,000 in insurance benefits, and given away over $500,000 to the needy, frequently not members of the order.

THE Suez canal is very largely used by English merchantmen. It is said that 90 per cent of the enormous trade between England and British India passes through the canal. Two-thirds of the business done through the canal is of Anglo-Indian origin.

Gold and Silver to the Front.

Base metal mines seem to be preferred in this region just now; but this will not continue much longer, as they are too expensive to work and the resulting profits are too small. Ere long the mines of Rock and Camp creeks, at the head of Croy gulch, will step to the front in public estimation, and occupy the position which gold and silver mines have occupied for the past 25 years. No kind of mine pays so well and at so little labor as a gold mine. Given a vein four feet in width, ore averaging not over $5 per ton, and, under proper management, it will yield a net profit of $2 per ton in a water-mill that would not cost over $200 to the stamp, or about $100 per ton of crushing capacity.

The mines of Rock creek, from all accounts (because, none of the ore having been put through mill process no reliable information of its value is obtainable), yield ores averaging fully $50, while the ledge—popularly known as the Big Camas vein—has a width of 10 to 60 feet. Even if the ore averages but $10 per ton, such a deposit must contain hundreds of millions of dollars, and the work of extracting this value will give employment to thousands of men.

These mines, which have been neglected heretofore, are about to be opened and exploited in a systematic manner. One mill—of 20 stamps, we believe—is already on the way here from Denver, and at least one more will surely be erected this summer. A strong syndicate, which will include one of the most energetic and long headed mining men in the world—Senator J. P. Jones, of Nevada—is, it is stated, about to begin operations there, and by this time next year the mines referred to will have been proved valueless, or mills of an aggregate daily capacity of at least 100 tons will be put in operation.—*Wood River Times.*

Miners and Store Orders.

Judge Ewing, at Pittsburgh, filed an opinion in the case of A. A. Kettering against the Imperial Coal Company, involving the question as to whether a store order given by any company to an employe is payment of wages within the meaning of the laws of Pennsylvania. Mr. Kettering had taken an order and received dry goods from defendant's store, but his counsel claimed he had not been paid in lawful money of the United States. The case went to the jury in this way, with the opinion of the law question reserved by the court. Upon this question the court says: "While we conclude that the act in question goes to the extreme verge of the legislative power, and that it is of a class of legislation of doubtful expediency, dangerous to the liberties and rights of the people, an importation from monarchial institution and in derogation of the broad liberties and rights which in the United States the people have heretofore enjoyed, yet we are not prepared to hold it to be clearly outside the powers of the Legislature and void." The issuing of store orders is made illegal in the act, and the court ordered judgment to be entered in favor of the plaintiff. The law in reference provides that all persons, firms, companies, corporations or associations, engaged in the business aforesaid, shall settle with their employes at least once in each month and pay them the amounts due them for work or services in the lawful money of the United States, or by cash orders, which must be redeemed in lawful money of the United States within 30 days and bear the legal rate of interest. The issuing of any order is deemed a misdemeanor under the act and is punishable by a fine of $100 upon conviction.

SWEETWATER.—Some Salt Lake parties interested in the Sweetwater, Wyoming, gold mines, report that a boom will hit that camp this season. A French company has secured control of 1,500 acres of placer ground, which has been thoroughly prospected, and is to soon commence the construction of a large water-ditch from the head of Rock creek, the Sweetwater and other streams. This ditch will be 22 feet wide in the bottom and over 20 miles in length, and will furnish an ample supply of water for working a vast tract of heretofore worthless placer ground. Besides this, some flattering developments have been made in several quartz claims near Atlanta, where a vein varying from seven to nineteen feet in thickness, and carrying from two to nine ounces of gold to the ton, has been opened up. Two or three hundred pounds of ore was received at Frank Foote's assay office a few days ago, from which a series of assays were made, and it is understood preparations are now in progress to work these mines vigorously. There is also some talk of a branch railroad, forty-five miles long, being built into the mines this season from a point on the Union Pacific near Green River. People living in the region of the old South Pass are to be congratulated on the prospect of a renewal of mining operations there.—*Salt Lake Tribune.*

THE geological survey of Japan, begun about four years ago by the geological office, is now declared completed.

The Enriched Grained Varieties of Redwood.

It was not until many millions of feet of the more richly grained redwood of California had been recklessly and thoughtlessly consumed for general purposes, that special attention was attracted to the fact that a considerable percentage of redwood lumber possessed characteristics of great beauty and inherent qualities as to shrinkage and in other particulars, which entitle it to favorable consideration among the ornamental wood of the United States for manufacturing and house finishing purposes. During the earlier periods, and until more recent years, the rich, curly "bird's eye" and other peculiarly marked species were cut for "rough lumber." The softer, straight grained kinds being so much more "easy to work," less liable to shrink endwise, and not so liable to split in nailing, became the favorite material for building and other purposes for which redwood was used, to the exclusion of the wavy and peculiarly grained varieties from the list of first-class redwood. Consequently, trees or logs indicating the very features which of late have given prominence to California redwood, were cut into plank, scantling, and dimension lumber, where size and strength were especially required; and millions of feet of choice grained wood have been split into railroad ties, and cut up for firewood, and otherwise destroyed, which, if to-day was available in board lumber and on the market, would command a largely advanced price over and above present merchantable, first-class redwood.

The redwood forests of California have yielded some most beautiful specimens of tree growth, which, for richness and peculiarity of grain, is excelled only by the finest of costly hard wood. The peculiarity of shrinkage endwise is, perhaps, special to this wood, but does not extend beyond thorough seasoning, which perfects itself much more rapidly than in California sugar or Eastern States pine. The value of the one discarded kind of redwood for manufacturing and finishing purposes has greatly increased during the past few years, and the present demand is greater than the supply of the "handsome variety," even for home consumption. Consequently manufacturers of redwood lumber are paying attention to this fact, and will in the future regard with special interest such trees as will produce the rich grained article.—*California Architect.*

American Saw-mill Machinery for Europe.—A correspondent writing from Berlin, Germany, to the American *Exporter* says that with few exceptions all the forests of Europe are to a certain extent exhausted, and that their production to-day is consequently not sufficient to supply the demand made upon them. France and Germany are therefore compelled to supply their wants from Austria, Hungary and Russia, which countries find it more difficult every year to satisfy their customers. In the north and south eastern part of Europe there are still large tracts of timber lands, but they are for the most part inaccessible to the lumbermen of the country for want of means of transportation or of suitable machinery. For these and other reasons, there must grow up the demand for better and more suitable saw-mill machinery, and the inference is that the machine of the future for those people must be only the American circular saw mill, which is comparatively unknown to them. It would seem, therefore, that the manufacturers of saw-mill machinery in this country have excellent chances in Europe which should be no longer neglected. The prices obtainable will bring far better returns than the manufacturer can realize here at home, and, if they start their business properly and shape the circumstances to the wants of the European countries, they will earn not only greater, but quicker, profits than can be obtained in the United States.

Architectural.—At the last meeting of the San Francisco Chapter, American Institute of Architects, a report was presented in which it was intimated that the best way to advance and cause an interest to be felt in the Chapter, particularly so by apprentices and draughtsmen in the various offices, was by the furnishing of a suitable room which would be recognized by parties interested as a home. The local organ of the profession thinks the idea is a worthy one, and suggests that a room should at once be secured and properly furnished. All the different journals and periodicals referring to architecture, carpentry, modeling, decorating, etc., should be kept on file. A room should be conveniently near in which a workbench could be placed, in order that practical lessons may be demonstrated in the various callings.

Lumber to New York.—The Oregon Lumber and Mill Company is shipping to New York samples of timber from that region. They say: "We were in hopes to send some timbers 20x20, 120 feet long, but could not get them into the ship's port. We hope soon to send a cargo of lumber East. We think that when the Panama canal is finished the Pacific Coast will ship a large amount of lumber to all Eastern cities." Of course all the lumber at present goes around Cape Horn, which indicates the cheapness with which lumber can be furnished on the Pacific Slope.

Useful Information.

Petroleum a Wood Preserver.

To the line upon line of practical tests long continued with petroleum for shingles, latticework, the timber part of tools, in short, all wood exposed to weather, a *Rural New Yorker* correspondent adds this strong confirmation:

"Fresh, light petroleum, if applied warm, will penetrate—if the wood is dry—almost as readily as water, and once thoroughly saturated, 'it is there to stay'—water will not wash it out. I have been for years a producer of crude petroleum, and have yet to find a board or piece of timber connected or otherwise with the works, that had been once saturated, which is not sound where the oil touched, while frequently parts not oiled have decayed rapidly. I have just finished taking down, and making over into smaller ones, a wooden storage tank. This was first built over eighteen years ago, and left exposed to all kinds of weather. We did not find one rotten spot in it; everything was sound. I have known oil barrels, and also small tanks, to be covered with a thin layer of earth and remain so, in one case for over fourteen years, and come out sound."

He especially states that, saturated with this moisture-repellent from nature's own laboratory, sills of barns and similar buildings will outlast any other part of the frame; and he remarks that after the first two or three days the application does not expose wood to any increased risk from fire.

The Value of Old Stamps.—The demand for old postage and revenue stamps by philatelists has given most of them a value above their face, a few of them going as high as $100 apiece or more. A Brattleboro stamp was sold for $300 last year, and the purchaser would not have sold it for much more. The standing price for this stamp is $250, as we notice from a dealer's catalogue, and we presume that he gets nons at that. The Alexandria, Va., 5 cent stamp of 1845 is worth $100; the Baltimore 5-cent stamp of 1846 also sells for $100; the red 5-cent stamp issued at New Haven in 1845 by Postmaster Mitchell is worth $15, and his blue stamp, $25. The New York City 3-cent stamp of 1842 on buff paper with picture of Washington has a value of $75; on violet paper, $25; the 1-cent stamp of 1849 on drab paper, $15. Ten dollars can be got for the 10-cent stamp issued at Providence, R. I., in 1846, and $35 to $25 for St. Louis stamps of 1845. Old Government postage stamps, that is, from 1847 to about 1860, bring from one cent each to $10. Stamps of later date bear lower prices, though two of 1869 are worth $35 each and one $30. Newspaper stamps are not so valuable. A new $60 lilac stamp of 1875, with picture of Indian girl and grapes sells for $65. A new 3 cent Post-office Department stamp of 1873, on white or amber paper, is worth $50; a new $20 State Department stamp of 1873 is worth $25, or $15 if used. New or unused stamps are in all cases more valuable than canceled ones, some of them having double the value.—*Paper World.*

The Tupelo Gum and Willow Oak.—The tupelo gum and the willow oak are timbers that are destined to a commercial value never until recently dreamed of. A gentleman residing in Mississippi, who has tested them thoroughly, says the first variety is almost as soft and light as the cork of commerce, and is the whitest timber in the valley. It is extremely light, and cannot be split, and at the same time it is very tough and tenacious and will bear a very heavy strain. It will, some day soon, be used principally for buckets, bowls, pitchers and trays; also for ox-yokes and for almost all kinds of water vessels. For bread trays it is the finest in the world. This wood grows among the cypress trees, and is far more abundant and floats like cork. The water or willow oak is second only to the liveoak, and is almost an evergreen; it takes the coldest weather to make it shed its leaves, and it is almost as hard when seasoned as the liveoak, and for the rim and spokes of wheels it has no superior. For ship-building it will almost equal the liveoak. "I have tested the crushing capacity of this wood," this Mississippian says, "and also the transverse strength, and it is one-third stronger than any white, post, red or black oak, and only one-eighteenth less than live-oak. And yet this wood has no market value!"

Benzine Jelly for Removing Spots.—120 ounces of white soap are dissolved in 180 ounces of hot water in a liter bottle, 30 ounces of ammonia added. The solution is then made up to three-fourths of the bottle by the addition of water, and the whole shaken up. A tea spoonful of this mixture is placed in a bottle holding 250 ounces, and mixed therein with some benzine, and afterward the bottle is filled with benzine under protracted shaking. The result is a gelatinous mass from which the benzine evaporates but slowly. It is useful in removing spots from articles of apparel.

Concerning Glass Cloth.—"Several years ago," says the Boston *Transcript*, "quite a furor was created by the announcement that a Pittsburgh glass manufacturer had discovered a method of spinning glass so fine and so pliable that it could be woven into dresses, outside wraps and garments of all kinds. The statement was received with incredulity, and a leading foreign journal, which published the statement of the discovery, felt called upon to apologize to its readers for having endeavored to dupe them. Several months later the manufacturers of the article caused the journal to acknowledge the receipt of a piece of the wonderful cloth. The eagerness to see the material was unbounded for months, and letters by the hundreds, from every clime, were received inquiring the cost of the novelty. The reply, $20 per yard, never brought back any answer and put an effectual quietus on the anxious correspondent. Genius had triumphed, but only partially. It was found impossible to manufacture the article for less than $20 per yard, and soon the furor over it subsided."

Gum on Fruit Trees.—Samuel Miller says in the *Rural World:* "As the war in Egypt is likely to make gum arabic scarce and high in price, those who have peach or plum trees can make their own mucilage. Lumps of gum will be found on every tree, which, when dissolved in water, makes a most excellent substitute. I have been using it all summer, and find it to answer the purpose first-rate. If this same juice was clarified, and while in the soft state sweetened with pure sugar and a little spice, it would be much better to eat than the pernicious stuffs that are sold by confectioners as gum drops, and which are, no doubt, made of some animal offal, and doctored up with chemicals, and which should have gone to the glue-pot at the start. There have been times here after rainy weather that pounds could have been gathered."

To Protect Maps, Pictures, Etc.—Coat a plate of glass thinly and uniformly with a warm mixture of one-quarter of an ounce of ox-gall and one quart of solution of glue, which will form a stiff jelly on cooling. When the film is set, render it insoluble by immersion for two or three hours in a solution of acetate of alumina, which may be formed by dissolving one ounce each of alum and of acetate of lead in a pint of water, and decanting the clear liquid from the sulphate of lead formed. Then wash and rinse well, give it an additional thin coating of a weaker glue solution, and lay the picture, slightly but uniformly moistened, upon it, face downward; smooth out by gentle rubbing, place in a warm room for three or four days, and remove from the glass when thoroughly dry, by cutting the film around it. The back of the picture may be coated in a similar manner, and it will lie flat without a frame.

Receipt for Mouth Glue.—Isinglass and parchment glue, each one ounce; sugar candy and gum tragacanth, each two drams. Add to them one ounce of water, boil the whole till the mixture appears when cold of the consistence of glue. Then form it into small rolls for use. This glue wetted with the tongue, and rubbed on the edges of the paper, silk, etc., to be cemented, will, on their being laid together and suffered to dry, unite them as firmly as any other part of the surface.

Good Health.

Happiness a Habit.

Every permanent state of mind is largely the effect of habit. Just as we can perform an action so continually that it comes to be habitual, so we can encourage conditions of mind till they, too, come to be habits of thinking and even of feeling. Every thoughtful parent or teacher recognizes this in the training of youth. The child constantly thwarted or scolded or ridiculed has constantly aroused within him feelings of resentment or discouragement or misery, and these grow to be habitual, and a character for ill-temper or moroseness or despondency is formed. On the other hand, the child who is wisely treated, whose faculties are brought into action, who is encouraged to do well, who is surrounded with cheerful faces and orderly arrangements, becomes accustomed to corresponding habits of thought and feeling. The exercise of self-control, of truthfulness, of honesty and other essential qualities, not only results in habitual actions of the same nature, but in habitual feelings or state of mind that induce those actions. So the condition which we call happiness is likewise acquired to a considerable degree. It involves within it many things but they are not impossible to secure, as when we have discovered them it rests with us to encourage or discourage them. Happiness is not only a privilege but a duty; not a more outward good that may perhaps come to us, but an inward possession which we are bound to attain. When we remember the contagious character of happiness, the strength, courage and hope it excites by its very presence and the power for good it exerts in every direction, we cannot doubt our obligation to attain as much of it as is possible.—*Pa. Ledger.*

Sewer Gas a Cause of Measles and Pneumonia.—Attention is called by the *Sanitary World* to an extraordinary outbreak of measles among the children of a public institution, caused by sewer gas. The medical officer states that in the early part of October the drainage became choked, and the sewers had to be opened. During the progress of the work the house became filled with sewer gas, and for some hours the evil was almost intolerable. Thirty-one days afterward an outbreak of measles and pneumonia took place, the whole of the children, 25 in number, being almost simultaneously affected. There were four deaths, and the cases were of a severe type, with high fever. While lecturing on healthy houses to the students of the Women's Medical College this season, the subject of sewer gas came up for some remarks, when one of the students, whose husband is a physician, remarked that she had two children. The bedroom in which they slept had the ordinary wash-bowl, with faucet for hot and cold water. The children coughed considerably during the night, and suffered with sore throats most of the time. The husband, suspecting that sewer gas might possibly enter the room from the water pipes during the night, had them closed. The result was, the coughing ceased at once, and the children have not been troubled with it since.

Now and Then.—There are many firm believers in the theory that most people are crazy at times, and facts seem to support their belief. A wise man will step backward off a porch or into a mud-puddle, a great philosopher will hunt for the specks that are in his hand or on his forehead, a hunter will sometimes shoot himself or his dog. A working girl had been feeding a great clothing knife for ten years. One day she watched the knife come down slowly upon her hand. Too late she woke out of her stupor with one hand gone. For a few seconds her mind had failed, and she sat by her machine a temporary lunatic and had watched the knife approach her own hand. A distinguished professor was teaching near a canal. Walking along one evening in summer he walked as deliberately into the canal as he had been walking along the path a second before. He was brought to his senses by the water and mud and the absurdity of the situation. He had on a new suit of clothes and a new silk hat, but, though the damage was thus great, he still laughs over the adventure. Our mail collectors find in the iron boxes along the streets all sorts of papers and articles which have been put in by some hand from whose motions the mind has become detached for a second. A glove, a pair of spectacles, a deed, a mortgage, a theater ticket goes in and on goes the person holding on to the regular letter which should have been deposited. This is called absent-mindedness, but this is a brief lunacy. A lunatic is a person whose mind is habitually out of balance.

When to Clean the Teeth.—Of all the people who clean their teeth regularly, it is certain that a very large proportion only do so once a day, and that generally at the time of their morning ablutions. A much smaller number also do so at retiring, but the number of those who make a practice of regularly brushing their teeth after eating, the most important time of all, is indeed very small. It is while eating that all the little cavities or interstices between the teeth become the repositories of fragments of food, or traces of some acids in the food are left in the teeth to cause incipient decay, and hasten it where it has already commenced. It is of course desirable to brush the teeth on rising in the morning and before retiring at night, but it is of infinite more importance that they should be thoroughly cleaned after eating. Decayed teeth, Professor Busch, of Berlin, holds, is peculiar to man, never having been observed in any animal. It is more prevalent among some races than others, and seems to affect the whole race. In this respect pre-historic man has no advantage.

Cocain a Nerve Food.—Dr. Aschenbrandt, of Wurzburg, has made some experiments on the action of murate of cocain on the human organism. He administered the drug, unknown to the subjects (who were soldiers), in doses about one sixth of a grain in cases of exhaustion and fatigue from various causes, and found invariably that the lassitude was speedily removed, and that the men could go on for hours without feeling hunger or thirst. One of his experiments was made on himself after a sleepless night, with the prospect of a long day's march before him, when a dose of cocain (taken in coffee about 3 A. M.) enabled him to go the whole day without feeling hunger, thirst, or fatigue, and he dined late in the afternoon with his usual appetite. He considers the drug to be a direct nerve food, and not a stimulant merely; but its stimulatiog action is certainly far above that of alcohol, and it appears to have no injurious after affects.—*Medical Rec.*

Moon Blindness in the Navy.—Vice-Admiral Close, of the British navy, has offered a singular explanation about the loss of the gunboat Wasp, recently wrecked off the Irish coast. There exists, it seems, a form of defective sight known as "moon blindness," persons afflicted with which are unable to perceive a light shining in darkness. It is easy to see the consequence of this infirmity in the navigating officer of a ship. Admiral Close says he nearly lost the man-of-war Trident once from this cause, only discovering in the nick of time that his navigating officer was unable to see the light of a lighthouse half a mile distant. If "moon blindness" is an established fact in medical science, the sooner provision for detecting it is made the better.

The organ of hearing is generally double, but not always located in the head. In the clam it is found at the base of the foot; some grasshoppers have it in the fore legs, and in many insects it is on the wing. Lobsters and crabs have the auditory sacs at the base of the antennæ.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned

CALIFORNIA.

Amador.

SMALL PROFIT.—Amador *Sentinel*, April 26: P. Reichling has been extracting quartz from the croppings west of the Kennedy, and milling it at the Kennedy mill, running ten stamps on the same. It does not pay anything big, but yields a small profit above expenses. He expects to make another run shortly. I. N. Dewitt is prospecting in one of his upper tunnels at Murphy's Ridge. In sinking on strata from the surface they reach a slip or slide of the hill to the east which have thus far cut off all the pay seams he has worked. In this tunnel he is working below the slip. This gives him a chance to prospect all quartz in solid ground, and should he find pay he will have to sink. He is in a good locality, one from which he has taken considerable gold. Several parties are working on Murphy's Ridge on shares with varing results. Nevills has a force of men at work on the so-called lime-kiln lead a few hundred feet south of the old Moon hoisting works. At present they are down about 30 feet, using a windlass for hoisting. The present size of the shaft is three and a half by five feet in the clear and are in the dry ground, but expect water in another ten feet. This shaft was sunk a number of years ago and said to be 70 feet deep and a number of tons of ore extracted and milled, but for some reason work ceased. A platform was put in at about 40 feet, and from that point up the timbers were taken out. If the old works are in good condition it will be an easy matter to reach the bottom and give the owners a good chance to prospect the ledge, and the result of such prospect will determine future operations. The donkey engine has not been set up as yet, and will not be, unless they find difficulty in draining the shaft. At the above depth the workmen have a vein of fair looking quartz a foot wide and a gouge on the hanging wall. Should the prospects be favorable it is said that future operations will be at this point. J. T. Wheeler picked up a nugget, said to be worth $110 the other day in the Grass Valley mining claim above Pine Grove. D. A. Crockett, near Pine Grove, recently sold a lot of sulphurets and base ore to the chlorination works at West Point, realizing $1,000. Two of the large engines at the Oneida mine, together with three boilers have been removed, destined for a mine in some part of Montana, but not owned by the same company. Only one engine and a boiler remain. From the indications this company will probably never make any further efforts to work this claim. Only a few men are employed at the Volcano tunnel, washing only when the dams become full.

RICH ROCK.—Amador *Dispatch*, April 28: Last Saturday, at the St. Julian mine, some 14 pounds of gold bullion was retorted from 18 pounds of amalgam that was crushed with one stamp in their mill in some 12 hours swing of the stamp. A. Caminetti, John Price, Dr. Chambers, D. Martin, Jos. Chatam, Pat Kelly and others were at the mine and mill while this retort of bullion was taken out. The St. Julian mine and mill is on the corner of the ranch of Dr. Chambers, and about six or eight minutes walk from his house and about five minutes from the ranch of W. A. Nevills of the Mammoth mine which the St. Julian joins on the south.

Alpine.

QUARTZ MILL TO BE MOVED.—Alpine *Argus*, April 25: A quartet of miners came to town last Tuesday from the Mammoth mining district, Mono county, to purchase a stamp-mill and outfit. They succeeded in securing from Mr. John Weis a mortar and five stamps from the old Advance mill, on the road between here and Mt. Bullion. They will proceed immediately to get the stamps ready for shipment to Mammoth where they will be erected.

Calaveras.

STRUCK GRAVEL.—Calaveras *Chronicle*, April 25: Pay gravel has been struck in the What Cheer mine, in Chili gulch. After clearing the mine of water, a bedrock tunnel was run in order to straighten the main tunnel and facilitate the work of getting out the gravel. The cutting through this bedrock has required some time to do, but it has now been accomplished and a bed of gravel 6 ft. and over has been encountered in a direct line with the main tunnel. The gravel is of good quality, prospecting well. The mine so far is looking very promising.

THE BODE MINE.—While in San Andreas last week we were shown some specimens of quartz taken from the Bode mine situated just outside of the town which, to say the very least, are exceeding rich. The pieces of rock shown us were full of free gold in large portions scattered all over the quartz. The Bode mine was discovered in 1852, and has been worked at intervals ever since. In the year above mentioned, a shaft 80 ft. in depth was sunk upon the mine and other prospects made along the lead. The mine is now owned by Mr. H. Bode, the hardware dealer of San Andreas, and Mr. William Wallace of that place, Mr. Bode owning the controlling interest. A shaft in the neighborhood of 80 ft. has been sunk and a tunnel of about 100 ft. in length has been run on the vein. Some of the rock which was milled yielded $10 a ton. Another shaft is now being sunk upon the vein and the prospects are flattering in the extreme.

El Dorado.

TUNNEL.—Placerville *Observer*, April 24: The contract recently let for running the 50 feet in the Darling mine, over on Bear creek, by H. P. McNevin, having been completed last week, and the ledge continuing unbroken, about the same, a contract to extend the tunnel 50 feet was let. The ledge is 2½ feet in width, and will mill about $7.50 per ton, as near as we can ascertain. If the ledge holds as good for the next 50 feet, it strikes us that it is one of the best partially developed mining properties in the county to gamble on. The walls are slate on one side and granite on the other, with a vein of living water along it—a good characteristic for a permanent ledge.

IMPROVING.—Georgetown *Gazette*, April 22: T. F. Lewis' quartz mines near Slate mountain, is improving as development progresses, so much so that parties are anxious to bond the mine. Since crushing began on the Slate mountain mine, some two or three weeks ago, exceedingly good results have followed. We are pleased to learn the Grover boys are meeting with gratifying results in their work of development on the southern extension of the above mine. Work on the Idaho mine of Georgetown, preparatory to placing the mine in permanent working order, is being pushed ahead with vigor under the management of Steve Moore, of Grass Valley. The St. John drift mine at Tipton Hill, is being started up by J. W. Houston, of Sacramento county.

Mariposa.

DILTZ GOLD BONANZA.—Mariposa *Gazette*, April 25: The ore body which developed from the surface wash of last winter improves as the work progresses. The ledge in this new shaft is increasing in width and improving in quality. As it is all virgin ground above the tunnel level to the north for 1,700 feet, it is impossible to estimate the number of tons of milling ore now uncovered. The hundreds of tons of ore and vein matter which have passed through the wash during past seasons when water could be obtained for sluicing purposes, has already paid an average of $15 per ton leaving large quantities of quartz containing free gold, which is piled up, yet to be milled.

IMPORTANT SALE.—The Eureka quartz mine, of Hornitos mining district, has been sold by S. C. Bates, banker of Merced, to a company, of Providence, R. I., for the sum of $75,000 cash. The sale was effected through reports made upon the property by S. E. Holcombe, M. E., of San Francisco. The two mills are running upon rock taken from the mine, and large results are expected. Other properties are being examined by S. E. Holcombe, and if found favorable, sales will be made at an early day. The Paddy M'Cann mine, which is a continuation of the Diltz mine, is simply awaiting development to blossom out to be a good mine, with the chances of being as good as any in that neighborhood. Notwithstanding this mine has been claimed for many years, all that has ever been done is a shaft about 50 feet deep. The Schroder mine, which is close by on Saxton's creek, is held under a U. S. patent as a placer mining claim, containing 20 acres. Mr. Schroder procured a patent for his claim several years ago, since which time he has constructed a ditch about two miles in length taking the water from the head of the creek to a point below where he is compelled to jump the creek, about 75 yards across, spanning it at the highest point, 100 feet, which carries the water to the heavy deposit of his claim. Whenever there is sufficient water his Little Giant is called into requisition which confronts a bank of dirt and gravel from 10 to 30 feet deep. Notwithstanding the quiet manner in which Mr. Schroder has work his hydraulic, enough has leaked out to the public that it contains gold in unknown quantities and sufficient has been gathered into the family purse to warrant an outlay of some thousands of dollars in improvements to work the mine upon a scale larger than the ordinary mode of extracting gold from placer claims. This neighborhood of mining is proverbial for its quiet, reticent and unobstrusive manner in which the mines, veins, hill and gulch diggings are worked. There are other good mines in this neighborhood that have been secretly worked for years by men well known to the community, but they have become so commonplace in their daily vocation that no notice is taken of them, while at the same time it is believed they have lots of the rich metalic substance stowed away.

Mono.

THE CON. PACIFIC.—BODIE *Miner*, April 27: Since last report have no material change to note neither in northwest drift or in the cross-cut. The ledge in face of the northwest drift is 8 inches in width. Have had no assays during the week as ore is about the same quality as when the last assays were reported. Advanced during the week 7 ft., in cross-cutting cut some good looking stringers ore that have been very encouraging. The advance was 8 ft. Everything looks well.

THE BODIE CON.—The joint Bodie and Mono upraise, from the 550 ft. (Lent shaft) level, is now up 282 ft. The south drift 500 ft. level, is in 164 ft. The north drift 300 ft. level, is in 28 ft. The winze below the 300 ft. level is down 10 ft. Twenty-two men employed.

THE MONO.—The south drift from the Mono winze, 90 ft. below the 600 ft. level is in 13 ft. The south drift, 550 ft., (Lent shaft) level, was advanced 17 ft, being in 320 ft. from the Bodie line. The joint upraise is up 282 ft. Eleven miners and one engineer employed.

Nevada.

NEW QUARTZ MILL.—Grass Valley *Union*, April 22: Joseph A. Everett came down from Omega yesterday. He is at present engaged in putting up a 20-stamp quartz mill, near Diamond creek, for the Celia Mining Company, an Eastern organization, and expects to complete the job in the next sixty days. He says everything indicates a big quartz boom in Washington township.

DOWN FROM THE DAM.—Nevada *Transcript*, April 22: Dan A. Rich, who has charge of the celebrated Fordyce Dam, the property of the South Yuba Canal Company, whose principal office is in this city, arrived in town yesterday. The dam, which is the largest on the Coast, is full of water, and the snow on the north side of Red mountain is three and a half feet deep. The probabilities are that the water season will be short, on account of so little snow in that section.

ROCKY BAR MINE.—Grass Valley *Union*, April 25: There are now about 30 tributers at work in the Rocky Bar mine, a portion of the force being at work on the south pitch of the ledge, intending to work it through the Kelly shaft, which has been in disuse for some years. This shaft has been put in repairs, and a hoisting engine is being put over it. The workings at the bottom of this shaft have been drained by the pumping out of the water in the North Star mine, which will be an advantage in expediting the work of the tributers.

WASHINGTON TOWNSHIP MINES.—Grass Valley *Union*, April 26: The Yuba mine in Washington Township has now a large ledge of a good quality of ore, and it is said the company design increasing their milling facilities by adding ten more stamps to their mill, which will make in all 25 stamps. The capacity of the 10-stamp mill of the Eagle Bird mine is also to be increased by the addition of 10 more stamps. The mills of both of these companies are run by water-power. The Lindsey mine is said to be looking very well. These mines have large bodies of low-grade ore which can be milled at a profit owing to the use of cheap water-power.

NOTES.—*Tidings*, April 25: M. Gauthier is going to erect 5 stamps on the Crown Point. The 14-level in the Idaho is looking very well. The other levels contain but average milling ore. The Empire still continues good, so good, in fact, that the owners are going to add 30 stamps to the already 20. This is a good showing for the oldest worked mine in northern California. The custom mills are running regularly upon ore from prospect shafts. The owners of the custom mills say that they have been running more regularly for the past few months than ever before at this time of the year. The North Star company have made arrangements to crush rock at the Rocky Bar mill and commenced Tuesday. There are now about 100 loads extracted from different levels of the mine by the tributers. The rock shows well in free gold and sulphurets. The resident trustees (or directors) took a trip through the New York Hill mine on Tuesday, and we learn from Mr. Peter Johnston, one of the directors, that the mine now looks better than it has for the past two years. The miners are stoping above the 10-level, and are sinking a winze and breasting in the 13-level. The prospects are particularly encouraging, for there is pay rock now in sight that will run the mill for two years.

THE BONANZA DISTRICT.—Nevada *Transcript*, April 20: Mr. Baker has bonded one of his ledges, called the German, to a San Francisco company for $10,000, payable in one year from the time the agreement was entered into. Work was to be commenced on the mine within thirty days after the bond was signed and delivered. This property is located just below the mouth of Diamond creek, on the south side of the river. It is supposed to be a continuation, running south of the Canyon Creek mine, now owned by Geo. G. Allan, of Nevada City. The Rodda boys, claimants of the Golden Gate ledge, have a very promising prospect lying a little east of the German. They have a shaft down on the ledge, which is a vein of from 7 to 8 feet wide, and all of a good character of rock. The next mine of any importance lying to the east is called the Bluejay, and is owned principally by Blue Tent parties. They have a tunnel in on the ledge over 100 feet carrying a fair-sized vein most of the distance, all good looking rock, showing free gold in many places. They have a contract which calls for another 100 feet of tunnel, which, it is thought, will thoroughly prospect the ledge. Farther up the hill, just below and to the west of Lindsay mine, is a ledge called the Live Oak. It is owned by Mr. Thomas Maloney, of Washington, and the Baugh Bros. They have a vein about 5 feet wide, well defined, and which shows free gold from the croppings down. It dips to the east and runs a few points to the west of north, as all true veins do in this district. The Co. at the Cornucopia and Secret Treasure have started a drift from the bottom of their shaft running north into the hill. As soon as 50 feet is reached sinking the main incline will be resumed. At the Yuba mine their main shaft is down 280 feet. The ledge on the 200-foot level in some places is 14 feet wide, and the rock shows very rich in free gold and galena. Forty tons of ore per day is put through the mill with only fifteen stamps, and the general average of the rock is not less than $8 per ton in free gold; no sulphurets being saved, although two Frue concentrators stand idle in the mill. Their pay at the present time is all in free gold, the company not making any effort whatever to save anything else. The Yuba mine is considered by miners up here to be equally as valuable a property as the celebrated Eagle Bird is to-day. The company at the Geo. Norton mine have a tunnel in on their ledge about 100 feet, carrying a vein varying in size from 2 to 4 feet, and all good milling ore, though at one end of the tunnel the vein is small but the ledge formation is uniform in width, walls, well defined and regular. At the Blue Bell and Sunset mines the manager intends to resume sinking on one or both shafts the coming week. This property seems to be the most attractive to capitalists of any here, on account of situation and conveniences, as well as being an old location and undisputable title. There is ample water-power the year round for all milling and mining purposes within 700 feet of the mine. Taken altogether it is a most desirable property to invest in.

Placer.

IOWA HILL.—Placer *Herald*, April 25: J. J. Rich, of Iowa Hill, was in Auburn last Thursday. He reports the Hill as lively and full of people, many being there from below, some seeking investments, and others on prospecting expeditions. The drift mines of that divide it is conceded have only as yet been touched. Capital alone is needed to open up some immense deposits, and this, it seems, is being attracted in that direction. The Mountain Gate mine at Damascus sent down to the Hill a few days ago 316 ounces of gold as the result of the last month's run with a force of from 15 to 20 men.

A BIG DEVELOPMENT IN A LITTLE MINE.—At times there has been a good deal said about Holden & Smith's little mine out near the Chinese graveyard. Their first find was a very narrow vein, but exceedingly rich. Several shafts developed that the rich chute was rather extensive. They worked along leisurely at taking out the rock, sometimes not procuring any more during the day than they could crush in a hand mortar at night, and yet, at this rate, the rock was so rich that they realized sometimes from $200 to $300 a day. They have been bothered with surface water from the start, and to overcome this they put up some time ago a small overshot water-wheel as a motive power for pumping out the water. By this means they have been able to go down. They followed the small vein into the bowels of the earth, satisfied with what it contained, but the other day, when at a depth of about fifty feet on the incline, they were happily surprised to find coming in from under what they had regarded as the foot-wall, a well-defined ledge of hard quartz, about eight inches thick and as rich, almost, as their little vein had been. This development proves that heretofore their operations have been confined to mere stringers, and now, with the discovery of the main ledge, they have a mine, and one which, judging from the richness of so much as is exposed, is likely to make the lucky owners rich, and have a favorable effect on the community.

San Bernardino.

SILVER ODESSA.—Calico *Print*, April 26: Last Tuesday we took a stroll through the drifts of the Silver Odessa mine in company with Major Geo. P. Gillis, the general manager, and Geo. Desallier, the tons. The chute connecting the bin with the ore house above is over 300 ft. long and almost finished. The ore house is a substantial structure 44 ft. long, where 20 men can conveniently assort ore. Seven large screens have been constructed for separating the ore. A car track 600 ft. long winds around the ridge on the west from the ore house to the main tunnel. Below the car track on the west and south there is abundant room for a waste dump, which could not be obtained on the east side of the mine. The old chute at the north-east end of the mine will be used for elevating supplies and material. The main tunnel that opens at the south end and extends northward through a broad ore zone, is over 360 ft. long. At intervals drifts have been run off from the tunnel, some of which penetrate ore and others are prospecting with good indications. The main tunnel, or spar drift, as it is called, follows the foot wall of a ledge which dips west into the hill, but the hanging wall has not yet been determined. Sometimes the pay streak is a foot or two in width, exceedingly rich, and then it widens into a large chimney of ore, permeated with born silver and chlorides. These chimneys are frequently 15 to 20 ft. in width, and have not been exhausted, stoping still progressing. The ore extracted from them is not assorted but is taken to the mill in the condition it comes from the mine. The ore breaks up and pulverizes easily, and the mineral in the chimneys exists in the innumerable seams that ramify through the ledge matter. Only a small percentage of mineral may be found in the chunks of this character of rock, but their surface is thickly coated with chloride and horn silver, a great deal of which falls off and is saved in the screenings. The ore also is found in narrow streaks of almost solid mineral. Some of the cavities formed in taking out the ore are very large, which have yielded hundreds of tons of ore each. The old tunnel, commencing near the old chute on the east side, is in over 200 ft., is 20 ft. above the main tunnel with which it connects, and is being extended in a westerly direction as rapidly as possible, cross cutting the main ledge. Drifting from this tunnel is progressing in several places, which are showing up well. A tunnel has been started from the south-east end of the mine for the purpose of intersecting the ledge some distance below the other openings which is in about 150 ft. and about to penetrate the ledge. The main spar ledge can be traced across the canyon 350 ft. below the upper tunnel. From 12 to 25 tons a day are taken from this mine to the company's mill at Hawley's station which gives an average of $80 to $120 to the ton. At least 100 tests of the ore each day are made at the mine as fast as new ground is broken, besides the samples that are assayed at the mill, consequently no unnecessary work is done, and the mine is worked systematically and with great profit. There are 40 men at work, but the number is not likely to be increased very soon, as the mill is now crowded to its utmost capacity with ore.

Shasta.

GOLD AND SILVER.—Shasta *Democrat*: About half the crew at the Silver King mine was discharged last week. We hear it stated that Wm. T. Coleman is negotiating for the purchase of several quartz mines near Shasta. We are informed that there are three or four San Francisco men on Squaw creek negotiating for mining property. The best ore that has yet been found in the Silver King is at the bottom of the 70-foot shaft. It assays up in the hundreds. We hear that Harry Burke, lately struck a rich prospect on the divide between French gulch and Deadwood. Dale & Fife have suspended taking out ore in the Silver King for the present, but the pumps are kept at work to keep the mine clear of water. We learn that the mine in Star gulch in which Ed. Reid and others are interested, prospects most encouragingly and is continually becoming better. Three prospecting parties equipped with pack animals and two months' provisions started for the mountains last Saturday. They were strangers from abroad. The Winthrop Mining Company started up its mill last Thursday, and the whole machinery works like a charm. The company is burning brick for another furnace. Dan O'Neal informs us that two Calico prospectors last week struck a rich gold quartz prospect on the second extension south of the Florida, between Star gulch and Quartz hill. We learn that a good-sized vein of coal was recently discovered in Clendenin creek in the Tamarack country east of Millville. It is said to be of good quality and makes good forge fuel. A. gentleman from Chico by the name of Mathewson last week purchased three quartz claims from Mrs. Myers, of Lower Springs. The claims are situated between Lower Springs and Salt creek. Monday we met Jewett of the Seamen's mine near Churntown. He says his company is still developing the mine uninterrupted by any mishaps, and the ore crush yields a fair profit. John Price, of Centerville tells us the winter has been a poor one for the placer miners around Centerville and Texas Springs. They have had an unprofitable winter's run on account of the scarcity of water. Monday at the express office we saw 45 pounds of amalgam from the McDonald Brothers' mine at Deadwood—a clean-up from a nine days' run. At $16 to the ounce this little chunk of amalgam is worth $8,640. Since the Mad Ox mine at Whiskytown has closed down there has not been much interest taken in mining matters around that burg. Those acquainted with the history of the Mad Ox are confident it is a good mine and would develop into fine property if properly handled. Windy Camp and Squaw Creek are just now attracting quite a number of prospectors and gentlemen seeking mining investments. The new gold quartz "finds" seemed to have caused the craze, and there are good prospects for Squaw Creek to become a lively camp this summer. A company of five of Redding's citizens secured an extension to the Whitton & Small mine on Squaw creek, which prospects "way up." A quantity of rock brought down a few days ago is literally peppered with coarse gold. If the vein-matter will average within 50 per cent as good as this sample it is a rich thing. S. Weil informs us that Mike Shay and A. C. Ellis recently struck a new and very rich shoot of silver ore on the Windy Camp mine on Squaw creek. The company owning the group of Windy Camp mines contemplate building a wagon road from the mines to the railroad, with the view of shipping ore to the Selby Smelting works at Port Costa. An acquaintance writes us from Lewiston that that beautiful mountain burg is all life and bustle, made by the boom in the mines around it. The Vermont mine, owned by H. E.

superintendent. The new ore bin at the south end of the mine is completed and has a capacity of 140 Willey, under the able superintendency of Joe Falon, is proving to be excellent property. The lead is from three to six feet wide, and the ore is now prospecting better than ever.

NEW DISCOVERY.—Red Bluff *Sentinel:* Major Kimball and Will Lunning returned last evening from the Bald Hill country, where they have been for several days surveying the outside lines of the Major's stock ranch, preparatory to fencing the entire tract. While surveying they ran across a quartz ledge and knocked off some rock, which they brought with them to be examined by experts and possibly sent to San Francisco to be assayed. For outside surface rock it looks very good, and in fact, native silver can be detected with the naked eye. The rock looks like the best croppings that comes from the Bully Choop mines.

Sierra.

SAVAGE MINE.—*Mountain-Messenger*, April 25: Judge Davidson and Robert Forbes went up to the Savage mine Thursday. The property at the mine was sold at sheriff's sale some time ago, and bid in by Mr. Dows, the party holding the attachment. He has been sinking on the channel discovered by the Savage company. This channel is narrow and no gravel has yet been found in it. It is thought to be a continuation of the Lilyput channel, which is opened about half a mile above. This is a singular channel in that it carries no gravel, although rich in gold. It is proposed to bottom the Savage channel, the shaft being now down about 25 feet. Mr. Gardner, of the Belmont Consolidated quartz mine, was over the first of the week from Poker Flat, for the rest of quartz mill which he is erecting. It will be in working order very soon, and the ledge will then give a good account of itself. A nugget, valued at about $400, was found in the Bald Mountain, Forest City, last week.

Trinity.

NEW RIVER.—Cor. Trinity *Journal*, April 28: Our camp gets ahead slowly, but sure. In my next I hope to chronicle some large sales, as there are good indications that San Francisco men will take hold. Just what is wanted is capital. The Development Company has sent a new superintendent in the person of Mr. J. M. McCormick, a man of experience, good miner, energetic and go ahead; attends to his own business; the whole camp says we have got the very man who is needed to fill the bill. Every day new discoveries are made in the mountains. Prospectors have brought in good rock from Plummer, Methodist and Know Nothing creeks, in each of which the placer mines were very rich.

DEADWOOD.—Trinity *Journal*, April 25: Deadwood is entitled to be be called the Bonanza district, for it is indeed the richest and most extensive quartz mining section on the Pacific Slope. So frequent are the good reports from that section that it appears like repetition to publish them week after week. A few days ago McDonald & Franck made a clean-up after 13 days run with their 5-stamp mill, and took out $10,000, to say nothing of the large body of rich sulphurets saved by the two Frue Concentrators. At the Monte Cristo mine, leased by Van Matre & Ramm, they are taking out some extraordinary rich rock, as we are assured that every piece on the dump shows free gold and most of it a great deal. A piece handed us by Henry Martin has been reserved for a place in the new cabinet, and we hope to be favored with many more from the mines of this rich district in the near future.

Tuolumne.

IMPROVEMENTS.—Tuolumne *Independent*, April 20: Messrs. White, Bacon & Co. are pushing the Divoll Bonanza mine. The tunnel has been completed to the old shaft, and will be used as a ventilator. Pumps will be put in and hoisting works erected. Wood contracts for the engine have been made, and every arrangement completed to go after the second edition of prosperity in this famed property. It may be that several new deposits have been formed since the old company quit, and it is also intended to capture these as well as the old mines.

SUMMERVILLE.—The Buchanan mine has been working steadily for three years or more, during which time they have uncovered several valuable chutes of ore. The Co. that own this mine has proved to be one of the best that ever operated in this county. They are just completing a large boarding and lodging house. It is rumored that they intend building a saw-mill some time during the coming summer.

QUARTZ.—Tetters has struck a quartz lead somewhere near the old Excelsior, above Sugar Pine. It is rumored that it is a good prospect, and that the rock shows considerable gold. Messrs. James Trevithick and Harry Adams were on a visit to Strawberry during the week. Mr. T. informs us that the Green Mine Company intends commencing work on their mine the 1st of May. Active work has been commenced on the Manzanita mine, near Soulsbyville, owned by James Pooley and Capt. R. Bolter. They are sinking a shaft. The Hyde mine started up the first of the week, a crew of men having been employed from Amador county. Tenders were received at the mine a short time ago to sink the shaft. Several men from Soulsbyville tendered for it, but the superintendent thinking the prices too high, rejected all the bids, and sent to Amador for men.

AT WORK.—Work is being vigorously prosecuted on the Argentum mine, by Dr. E. T. Wright, of Washington, D. C. A tunnel is being run according to survey made in 1864, which will tap the vein at a considerable depth, giving an abundance of stoping room. Dr. W. is a gentleman of energy and means, and that his efforts may be crowned with success, is our earnest wish. Joaquin Deluke, better known as Nervi, has a mine which promises to be something good. A lot of $8 rock was crushed sometime since, and, to the agreeable surprise of the owner, milled him $25 per ton. We have been credibly informed that Messrs. Jake Biddle & Co. have uncovered a $1,700 pocket at French Camp, above Pine Log. Hastings & McKenna have brought to light a small bunch of "filthy lucre," amounting to nine pounds. These insignificant strikes, together with those made on Bald mountain, go to prove that the "woods are full of 'em."

COLUMBIA.—The industrious miners are hard at work, delving among the boulders and on the hillsides, and adding, by their labor and its results, so much weekly to the general circulation, and giving an impetus to trade that very few other occupations can equal. It is said that Wright & Co., who have bonded the Argentum mine, north of Columbia, have struck a large body of good milling rock, some of which they are now crushing. T. C. Birney and R. Ham have, after a considerable time, labor and expense, completed a new and improved arastra on their mine, to the north-east of town. It works very well, and is running day and night. It is rumored that the Riverside and Sonnet mines are to suspend working for awhile. If so, it is to be hoped they will resume shortly. Dave Levy is still sinking in his "Old Tuolumne" mine. It is reported that the Oakland Mining Company will soon put up new hoisting works, preparatory to putting the mine in active operation. Capt. Griffin has the richest diggings we have ever seen. The claim is situated on the south side of Main gulch, near the end of Maiden lane. He has opened out a very rich streak of gravel, that will prospect from five cents to twenty-five dollars a pan. This is no exaggeration, but an actual fact, as many who have seen the dirt prospected will attest.

NEVADA.

Washoe District.

HALE AND NORCROSS.—Virginia *Enterprise*, April 26: On the 2,900 level, cross-cut No. 4 last evening was being steadily advanced to the westward and northward in the ore vein, and there was no falling off in the character of the ore. On the contrary, better average assays were obtained from the face, and the whole exhibited a permanent, even appearance, such as characterizes any regular ore vein formation. If its course is north, as seems to be indicated, the cross-cut, passing through it diagonally in a north-westerly direction, must soon reach its west side, unless it is wider than yet known or calculated upon. On the 3,000 level, the lateral drift south from cross-cut No. 2, in the ore vein, has been temporarily discontinued, in order to give the corresponding lateral drift north, on the other side of the cross-cut, a fair start. The second round of holes was blasted out last evening, and the drift found to be all in a solid mass of good ore. The intention now is to push this north drift ahead, in order to test the course and character of the vein in that direction, in conjunction with the northward work in the level above.

CONSOLIDATED CALIFORNIA AND VIRGINIA.—The drift running south-west into the Con. California and Virginia mine from the south line of the Ophir ground on the 1,300 level has been advanced 64 ft. On the 1,750 level we have started two upraises, one west of No. 6 stope and one south of No. 6 stope. The southwest drift on this level has cut east cross-cut No. 2 in the old workings, and we are now reopening that cross-cut. We have hoisted 589 tons of waste and extracted 57 tons of ore; the average assay value of the same, as per samples taken from 62 mine cars, is $39.12 per ton. We have shipped to the Morgan mill 367 tons 625 pounds; the average assay value of the same, as per samples taken from the railroad cars, is $28.50 per ton. Ore extracted under the Jones contract, 465 tons, the average assay value of which, as per samples taken from 503 mine cars, is $25.44 per ton. Shipped to the Eureka mill under this contract 588 tons and 1,070 pounds, the average assay value of the same, as per samples taken from the railroad cars, being $27.69 per ton.

BEST AND BELCHER.—On the 100 level a northeast drift has been extended 20 feet. This drift starts from the north lateral drift at a point 100 ft. south of the face.

OPHIR.—Having been easing timbers in the west drift on the 500 level. Hoisted 197 tons of waste for the Consolidated-California and Virginia, working through the south drift on the 1,500 level.

UNION CONSOLIDATED AND MEXICAN.—The joint Union and Mexican drift, running north on the 500 level, has been extended 61 ft.

SIERRA NEVADA.—The north lateral drift on the 520 level has been extended 47 ft.

Columbus District.

MOUNT DIABLO.—*True Fissure*, April 25: The west drift from the sixth level has been driven 12 feet during the week, and the face shows ledge matter giving low assays. The west drift on the fifth level has been stopped, and a north cross-cut has been started from the same. The winze to connect with the sixth level is down 48 feet, and shows a small streak of $80 ore. The stope above the west drift on the fifth level is looking well and giving considerable $50 ore. The intermediate stope, between the fourth and fifth levels, is giving some $80 ore. The intermediates, between the first and second levels, are giving some ore of good grade. A bullion shipment of $14,751.74 was made April 23d.

Galena District.

THE GALENA MINES.—Nevada State *Journal*, April 25: The prospects for a lively camp at Galena this summer are said to be good. The district, when organized by Judge McBeth, its discoverer, was in Humboldt county, though subsequently ceded to Lander. The *Central Nevadan* says there are some five or six mines in the district that are producing an average of three tons of ore daily which assays from $100 to $300 to the ton. The machinery for the new mill under course of construction by B. F. Wilson arrived last week, and will be speedily put in place, and when completed, the mine owners will be able to get their ore reduced at home, which will be a great convenience, as well as a saving of money. Mr. Wilson has stayed with the camp for many years, striving to develop the rich mines that he knew existed there, and he is now reaping his reward for his persevering labors, for it is an assured fact that there are mines in Galena that will pay to work.

Garfield District.

SHIPPING BULLION.—Candelaria *True Fissure*, April 20: Without any flaunting of colors or noise about what is being done, the little 5-stamp mill owned by Farrington Brothers situated in Garfield district, continues to ship bullion constantly, steadily and in goodly amounts. Two shipments per week are the average and each is valued at from $6,000 to $8,000. This would bring the month's total shipments up to between $50,000 and $60,000. About 14 men are employed in and about the mill and a few more than that number in the mine. The negotiations, which have been pending for the sale of this, the Great Western, property to an English Company, are still in progress and it is expected the first payment will be made on the first of next month. The product from this mine sends Esmeralda's contribution of bullion up among the big figures, and this fact is attracting attention to many other fine properties in the county.

Mount Cory District.

DULL.—Walker Lake *Bulletin*, April 22: It looks a little dismal, and the population is slim, but there are some here who came to stay, and it will not be long before the camp will again be a booming. It is the opinion of a great many mining men, that the Cory mine is a break from the big mountian, and the main ore body lies to the south.

Rebel Creek District.

THE OHIO MINE.—*Silver State*, April 22: We learn from F. P. Snapp that a vein of rich gold-bearing quartz has been cut in one of the drifts in the Ohio mine at Rebel Creek. The mine hitherto has been producing silver ore exclusively. The extent of the new find is not yet known.

Tuscarora District.

NORTH BELLE ISLE.—*Times-Review*, April 24: North drift, 150-foot level, extended 11 feet; total length, 163 feet.

INDEPENDENCE.—Fair progress made with the work at all points. No material change to report.

BELLE ISLE.—Drift north from east cross-cut, 400-foot level, advanced 11 feet; total length, 40 feet. Drift north from west cross-cut, 250-foot level, extended 6 feet.

NAVAJO.—Drifts and cross-cut on the 650-foot level, has been extended the past week 64 feet. South drift and east cross-cut on the 350-foot level, advanced 52 feet. Work suspended in No. 1 winze at the depth of 200 feet. Fair progress has been made in No. 2 cross-cut east. South drift on the east vein, advanced five feet. No. 2 upraise on the east vein, carried up five feet.

ARIZONA.

STERLING, Prescott *Courier*, April 29—The Sterling mine, at a depth of over 100 ft., is over 11 ft. wide. Good judges say it will pay over $20 per ton in free gold and that the sulphurets, which will be concentrated, are very rich. S. C. Miller's teams are on the way to Prescott with a mill for the Sterling. Mr. Dawes, of the Peck, is again in Prescott. He is satisfied with results of the tailings he is working; brought in some gold a couple of days ago, and will shortly bring in a great deal more. Mr. J. H. Brown, who has just returned from the Conger mill and Verde valley, tells us that the mill will start crushing Conger rock in a short time. Bush Bros., who are managing mill and mines, are good business men and will, Mr. Brown believes, achieve success. Twenty tons of ore from the Bullwhacker have just been worked at the mill on Lynx creek, and Mr. Brown, who was there when a clean-up was made, is satisfied that the rock paid $50 a ton in free gold. The owner of the Ethel mine, Hassayampa district, George A. Allen, who recently bought an interest, and R. W. C. Merrington, contemplate making a shipment of high-grade ore to Pueblo for reduction at an early date, the recent developments having made the owners feel pretty good.

BRADSHAW DISTRICT, Prescott *Courier*, April 25: Bond & Hayden have completed a water-wheel for Bill Bell, who is running arastras on East Humbug creek. Five men are taking black sulphuret ore from the Tiger mine; ore is worth about $200 a ton. Men are working near the old shaft. Charley Taylor is taking rich silver ore out of his Oak Flat mine. Bond & Hayden are preparing to hoist ore out of their own mine. E. S. Junior has a great many tons of high-grade ore on the dump. Gold rock (sulphurets) from a claim on the Oro Bonito ledge is roasted, and pays well in arastras.

TURKEY CREEK.—Mr. J. W. Wilson, a Prescott assayer, and Under Sheriff M. A. Lawler have just returned from a visit to the Mulvenon & Roach mine. They have pieces of ore which are very rich in silver. In it we noticed a great deal of black sulphurets, with some wealthy galena. Seven or eight tons of this staff will soon be shipped to a Colorado smelter. County Treasurer Cook and Mr. Moreland returned to Prescott yesterday from Humbug district. Mr. M. tells us that the mill is running, chloriders taking out rich ore and everybody pleased with results. The Crosscut mine is developing into a fine property.

PINE GROVE DISTRICT.—Messrs. Robbins and Gobin, lessees of the Del Pasco mine and mill, have very rich free gold quartz in a new shaft on the vein.

PECK DISTRICT.—Peck tailings are now run through raw, as we may say. The expense of roasting is saved, and the work of getting the silver out of the tailings is said to be very profitable.

COLORADO.

CRESTED BUTTE.—*Pilot*, April 23: There is no more desirable place in the country for ore reduction works than the Crested Butte. It is often the wonder of strangers that works have not been built here before, as the advantages here are much greater than other points. With all kinds of coal mined on the ground, as well as the coke being burned here, and with the superior water and timber advantages, certainly an ore reduction enterprise ought to pay. We believe the mines are far enough developed to supply ore enough for the demand, and by the erection of works it would give encouragement to develop mines that have hitherto been idle. It is reported that the owners of the Belle of Titusville will pay the forfeit money of $500 and take the mine back. It appears that Chas. H. Schue & Co. have got a working bond and lease on the property, with an agreement of some kind that the owners can take the mine back by paying the forfeit of $500. The property has proved to be so good on development that the owners have concluded to keep it. The sinking of the shafts and starting new drifts at lower levels on the Augusta, is proving that her ore bodies are immense, and that the richness of the mineral is steadily increasing with depth. Reports of recent assays of ore taken from the drift just started at the bottom of the deep shaft give returns of 256 oz. silver and 9 oz. gold per ton. This sample was supposed to be a fair average of the first class, which is now coming out in very large quantities. There is little or no waste rock, as the drift is entirely in mineral, and even the screenings give a value of 10 oz. in silver and $30 in gold. The boys on the Big Strike report a fine body of ore now coming in. The boys on the Hawkeye report the vein still improving and the face of the tunnel nearly all ore. No mill tests have been made recently, but assays give the value of first-class to be about $500 per ton. It is thought that the whole product of the tunnel will pay to mill should the company build a concentrator in the vicinity of the mine, or at Pittsburg.

IDAHO.

A PROPOSED MINE-OWNERS CONVENTION.—Wood River *Times*, April 25: During the past two or three weeks it has been evident that some steps were being taken by the mine-owners looking to some sort of an organization between them to conteract the organized action of the Miners' Union men and for other purposes; but exactly what would be done in the premises was not known. A well-informed business man who claims to know, however, informed a *Times* reporter this morning that the preliminary steps have been taken for a conference of the mine mine-owners of Alturas county, to be held in Hailey on or about the first of May, with the view of arriving at some understanding regarding their future course, not only concerning wages, but concerning rates of freight and charges for sampling, reducing and selling the Alturas ores and their yield. Several of the mine superintendents have already signified their willingness to take part in such a convention, and favorable responses are looked for from Rocky Bar and Atlanta. The convention will, therefore, doubtless be held.

MONTANA.

MARYSVILLE.—Helena *Independent*, April 22: The great complaint in this section, like every place else, is the dullness of times. Yet what is being done appears to be prosperous. About the Drum Lummon everything is running smoothly, bullion shipments being large and regular. Cotter & Hickey's mines and mill at Mount Pleasant have commenced the summer's operations. Mr. P. H. Shannon, the owner of the Sanford mine at Mount Pleasant, has recently bought the Emma Miller, arastra and mill site, between this place and Belmont. It is supposed that Mr. Shannon will erect a mill on this site which, by the way, is the finest location for a custom mill on the creek, and accessible from all mines. Should custom work be done here it would give this district its greatest boom, and show its real value. The Nine Hour lode, after having been proved to be a real bonanza, is now lying idle. Rogers & Curren have struck a small but very rich vein on Cruse Hill, almost in the town, and are getting quite a pile of rich quartz on the dump. At Bald Butte a number of parties have been extracting very high-grade gold quartz from the Doc Parker, Griff and other lodes. A mill will be built there this season for working this quartz.

THE MISSOURI LODE.—A fine prospect was discovered recently within one mile of Wickes by W. J. Dunn, Wm. Nelson and Wm. Hoback. At a depth of 12 feet the vein opened out to 14 inches of fine galena of good ore. The find created considerable excitement in the camp, which was supposed to have been thoroughly prospected years ago, and, previous to the storm now prevailing, picks and shovels were in great demand, and the hills were dotted with prospectors anxious to equal, if not surpass, "The Missouri"—the name of the new lead.

NEW MEXICO.

GOLD HILL.—Cor. Silver City *Enterprise*, April 24: McLane, Rodgers & Hart have just finished a tunnel on the Standard mine owned by them, tapping the lead 150 feet below the surface, and the showing is very handsome. This seems to prove the leads to that depth. McCone & Keister have struck a new claim. Giddings & Miller shipped 1,000 pounds of ore to Silver to have it sampled. George Goodwin shipped four tons of ore netting, as we understand $185.50 per ton. Winter's new strike blisters handsomer than any rock we have ever seen. New strikes are daily reported in camp, and all claims are looking fine. At any depth the leads are strong and free metal is common. H. H. Bell, we understand, has made a very rich strike. We understand that a stamp mill or smelter will be put up at Lordsburg, or that they are under process of erection at that point to treat Gold Hill and Malone ores. Many who have rich ores are waiting, as they can afford to do, for machinery to arrive in camp, so rumors reach us,

UTAH.

REVIEW.—Salt Lake *Tribune*, April 27: The week has averaged stormy, with one of the worst snows of the year. Yet the movement of the metals was fair. The receipts of bullion and ore in this city for the week ending April 22d, inclusive, were $78,095.07 of bullion, and $12,800 of ore; a total of $90,895.07. For the previous week the receipts were $64,841.85 in aggregate, of which $58,070.38 was bullion and $6,771.47 ore. The shipments of the Ontario for the week were 68 bars, of the value of $42,841.24; bringing the total output of that great property for 1885 to date, up to $551,105.85. As announced several days ago, the Ontario will be shut down in May for a clean-up, after a twelve months' successful and continuous run. There is nothing new from the Horn Silver. Mine and smelters are practically at a stand-still. Sales of this stock in New York for the week ending April 17th amounted to 3,300 shares at prices following: April 11, $2.35; 13, $2.40@2.50; 14. $2.45; 15, $2.40;@2.45; 16, no quotations; 17, $2.20@2.40. Receipts from Silver Reef for the week aggregated $7,166 in silver bars, of which the Stormont sent three, valued at $4,050, and the Christy two, valued at $3,116. The Vienna sent down from the Sawtooth one bar of bullion, valued at $1,920. The product of the Hanauer smelter for the week was eight cars of bullion, $20,110. The Germania's first report after starting up was two cars of bullion, $4,557.83. Ore receipts were $4,450 from the Honerine; $2,000 from the Crescent, both fo Utah; and $3,950 from the Queen of the Hills; $1,100 from the Minnie Moore; and $1,300 from the Eureka, all of Wood River,

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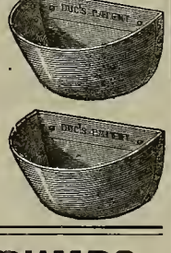

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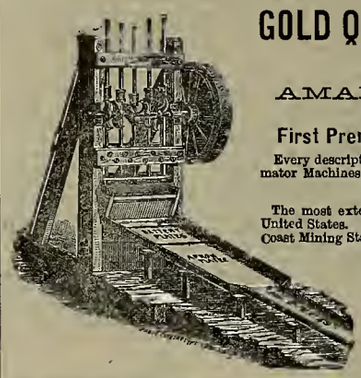

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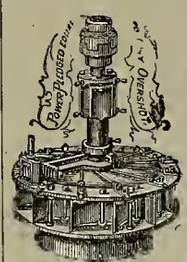

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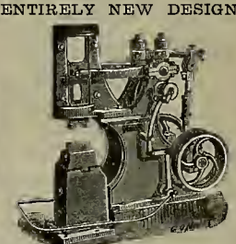

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"Does not vibrate."
"Requires no helper."
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"Can be run cheaply and with very little power."
"The anvil is entirely separate from the frame."
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"Does not chill the work."
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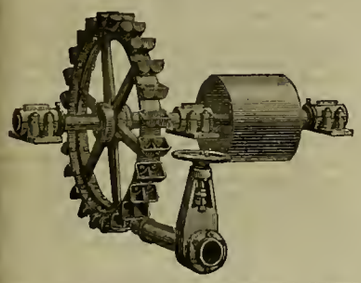
PELTON'S WATER WHEEL.



THIS WAS ONE OF THE FOUR WHEELS TESTED by the Idaho Company at Grass Valley, Cal., and gave 90 2 per cent., distancing all competitors. Send for Circulars and guaranteed estimates.
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ROCK DRILLS — MINING PUMPS

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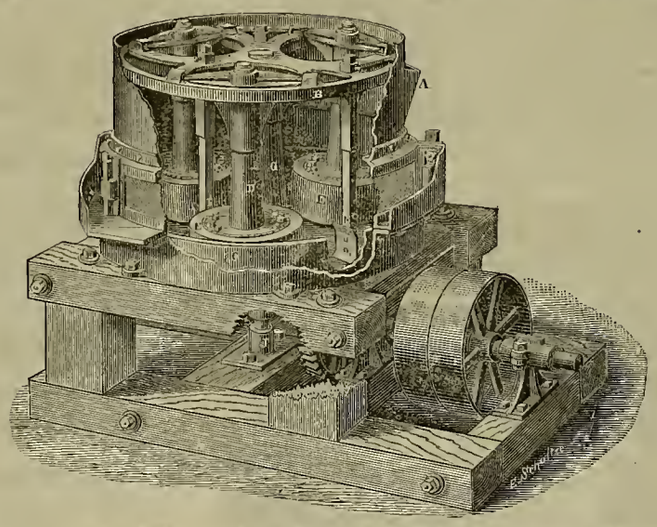

Ecomony in Expense of Plant. Economy in Cost of Working. Economy in Saving Gold. Economy in Transportation of Machinery. Economy in Cost of Erection of Mill at Mine. Economy in Time Required to Establish Plant (one day only being consumed).

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Sheet Metals of all kinds perforated for Flour and Rice Mills, Grain and Malt Driers, Furnaces, Chess, Cement and Smut Mills, Separators, Revolving and Shot Screens, Stamp Batteries, and all kinds of Mining and Milling Machinery. Inventor and manufacturer of the Celebrated Slot Cut and Slot Punched Screens Mining Screens a Specialty, from No. 1 to 15 (fine).
Orders Promptly Executed.

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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we ee confident from our experience we can well suit the demand for these goods, both as to quality and price. Our New Illustrated Catalogue, with prices, will be sent on application.
Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England.
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Ores worked by any Process.
Ores Sampled.
Assaying in all its Branches.
Analyses of Ores, Minerals, Waters, etc.
Working Tests (practical) Made.
Plans and Specifications furnished for the most suitable Process for Working Ores.
Special attention paid to Examinations of Mines; Plans and Reports furnished.
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GOLD AND SILVER REFINERY
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For Catalogue or other informat on, address:
THE MISSES HARMON, Berkeley, Cal,
Or E. J. WICKSON, 414 Clay St., S. F.

A Glance over the Mining Field.

The 16 mile ditch into Osceola, Nevada, has been completed and the water turned on. A large reservoir is next to he constructed. It will he soms little time before the first clean-up from the gravel tanks will he made.

Rathberg, Idaho, has shown some strikes recently that greatly brighten the future of that camp, aud indications point to it as one of great possibilities.

The leaching process seems to have revived the fortunes of the old camp at Marietta, Nevada. The mill has been idle a long time, owing to the refractory nature of the ores. Now, however, a shipment of bullion has been made. The copper the ore is removed hy leaching. New tanks e heing put up and business has revived.

Barber's mill, at Calico, has been running continually and successfully for some time on custom ore. It is one of the most complete and best arranged silver mills on the Coast of its size. Arrangements are heing made for enlarging its capacity.

The output of hullion from the Copper Queen, Arizona, has somewhat decreased. The lawsuit heretofore pending hetween the Queen and Prince mines has heen decided, but still a suit for damages hangs over the Queen.

Parties around Bannack, Moutana, are anxiously waiting for the snow to go off in the Elk Horn country, when a stampede will set in, as rich ore is known to he there.

Angels Camp, Calaveras county, one of the old-time districts, looks forward to renewed activity.

An 8-stamp mill is soon to be srected on the Cherokee mine, uear Altaville, in this State.

If the chloridization test at present being made at the Howell roaster at Bullionville, Nevada, proves a success, the leaching company will erect the large Stedefelt furnace right away.

In Plumas county, there are plenty of rich ledges, but capital has heen slow to come in thers, partly owning to ths location of the county, whioh is almost inaccsssible in winter.

The grading of the site of the new smelter hy the Copper Prince Company, Arizona, is nearly completed.

Small quantities of copper have heen received recently from Japan, and it is expected that large shipments of it will soon be made from that country. It is to bs hoped not, as we can produce more than ws want in this country, and want all the foreign markets we can get in which to dispose of our product.

The new mill at Copper City, in Shasta county, has started on its first regular run. The different mines in the district can now he properly tested.

The Calumet and Hecla copper mine, Michigan, will increase the sizs of its skips and underground cars so that an increase of 10,000 tons more of rock per month will be made.

Ths Mount Cory mine, Nevada, of which much was expected, has been closed down. It is not now known when work will he resumed, but there is reason for hoping that the stoppage is but temporary, as the ledge is plainly marked, and hut little work may develop another large hody of ore. The Walker Lake *Bulletin* pertinently remarks: "It is the opinion of a great many mining men that the Mount Cory mine is a hreak from the big mountain, and that the main ore body lies to the south." In confirmation of this remark, it is a well-known fact that in the whole series of ore veins helonging to the Manhattan Mining Company, on Lander Hill, in Reese River district, such breaks are frequently met with, but hy drifting beyond the hreak a few yards or a hundred feet, more or less, the continuation of the vein downward is invariably found. This merely shows that the whole slope of the hill has settled or slid, hreaking and carryiug the viens with it.

The travel into the Cœur d'Alene mines has heen very heavy. There is already a surplus of miners and laborers, and the wage-worker who goes in now solely with the idea of procuring employment in the mines is likely to be disappointed.

Work is being pushed night and day on the Virginia Creek Hydranlic pipo line, in Mono county. The pipes will soon all be cemented, and a great deal of profitahle work will probably be done during the coming season.

About thirty-five men are now employed in the mines at North Star, Utah. Properties that have lain dormant for years are heing reopened. The outlook is very favorahls and the chances are that the old camp will resume its old-time activity.

Work on the new trail from Weaverville to New River is heing carried on with all possible dispatch, and will he completed at an early day. The Trinity *Journal* says: "Parties contemplating a trip to the mines should remember that there is less than forty miles of horse-hack travel this way, ths rest of the journey heing made hy rail to Redding and stage from there to Weaversville and North Fork.

New ledges are reported as found on Eastman gulch, Trinity county, hetween the Hickey and Blakemore mines, and another on Spring gulch, a tributary of Indian creek. Good prospects havs heen obtained in both instances.

The mining outlook for Montezuma and Snake River valley, Colorado, is hrighter than it has heen for the past two years. Nearly every mine that has heen worked during the winter has a large shipment of good ore ready for market when the road is opened. The miners are in excellent spirits.

Thc smelters at the Great Horn silver mine, in Utah, are practically at a stand-still.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, department 10, San Francisco.

JOHNSON GRAVEL AND QUARTZ M. Co., April 25.—Capital stock, $1,000,000. Directors, G. K. Getchel, P. A. Wagner, H. W. Book, Wm. Duffenbacher and G. Withe.

FORT BRAGG R. R. Co., April 28.—The railroad is intended to run from the lide water at Fort Bragg Harbor, in Mendocino county, to the Noyo river head waters, in thal county, a distance of about 20 miles, and also a branch line to Ten Mile river. Directors, Otis B. Johnson, John C. Huggins, Charles R. Johnson, Calven Stewart, Charles E. Wilson and James Hunter. Capital stock, $200,000.

DORE PAINT Co., April 30.—Object, to manufacture paints. Capital stock, $1,000,000. Directors, H. E. Muller, H. W. Ball and W. B. Lake.

COMPASSES for pocket use. Muller, the leading optician depot, 135 Montgomery street, near Bush, opposite Occidental Hotel.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCA	N. NO.	AM'T.	LEVIED.	DELIN'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M and M Co	Alaska	10	35	Apr 3	May 4	May 20	T J Hay	306 Pine st
Alaska Marble M Co	Alaska	1	03	Feb 25	Apr 18	May 16	J M Wilde	405 First st
Belmont M Co	Nevada	39	15	Feb 11	May 7	June 1	J W Pew	310 Pine st
Champion M Co	California	19	08	Apr 23	June 1	June 19	T Wetzel	522 Montgomery st
Con Amador M Co	California	9	50	Mar 16	Apr 15	May 1	F B Latham	408 California st
Daisy Cement M Co	California	3	2	Mar 28	May 5	May 27	C J Collins	512 Montgomery st
Golden Fleece G M Co	California	1	20.00	Apr 18	May 25	June 15	F Schirmeker	Phelan Block
Joita Con M Co	Nevada	23	10	Apr 6	May 13	June 5	J Stedfeldt	412 California st
Mayflower Gravel M Co	California	29	10	Mar 26	May 5	May 29	J Morizio	328 Montgomery st
Mexican M Co	Nevada	55	20	Apr 20	May 23	June 13	G D Edwards	414 California st
Noche Buena M Co	Mexico	1	11	Mar 27	May 8	May 29	C Hart	106 Battery st
North Star G M Co	California	1	1.50	Mar 5	Apr 9	May 1	D A Jennings	401 California st
Overman S M Co	Nevada	55	20	Apr 20	May 23	June 12	G D Edwards	414 California st
Pinal Con M Co	Arizona	6	05	Apr 10	May 18	June 5	W Letts Oliver	328 Montgomery st
Puget Sound Iron Co	Wash Ter	11	50	Apr 14	May 25	June 25	A Halsey	328 Montgomery st
Pittsburg M Co	California	19	5	Feb 28	Apr 25	May 15	C J Bandmann	210 Front st
Rainbow M Co	California	13	15	Mar 14	Apr 21	May 20	P F Mohrhardt	307 Montgomery st
Santa Anita M Co	California	8	02	Apr 23	May 26	June 16	J M Buffington	309 California st
Sulphur Bank Q M Co	California	3	50	Feb 25	Apr 16	Jun 1	L Hermann	220 Sansome st
Summers Con M Co	California	3	25	Mar 17	Apr 20	May 12	F E Luty	330 Pine st
Tower Cou M Co	California	2	10	Mar 11	Apr 15	May 5	G W Sessions	309 Montgomery st
Union Con M Co	Nevada	30	25	Apr 16	May 20	June 9	J M Buffingtou	309 California st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Justice M Co	Nevada	R E Kelley	419 California st	Annual	May 1
La Grange Ditch M Co	California	A Halsey	328 Montgomery st	Annual	May 4
Marshall M Co	California	A L Perkins	320 Pine st	Annual	May 2
Morgan M Co	California	C S Neal	304 Montgomery st	Annual	May 2
North Star M Co	California	D A Jennings	401 California st	Annual	May 13
Papago Chief M Co	Arizona	S M Buffington	309 Montgomery st	Annual	May 4

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Kossuth M Co	Nevada	C K Sturtevant	328 Montgomery st	06	Mar 16
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Feb 13
Plymouth Con G M Co		W Van Nordeu, Pres.	23 Nassau st, N Y	50	Apr 6
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Feb 16
Syndicate M Co	Nevada	J Stadfeld Jr	419 California st	10	M y 5

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE. Apr 22-Apr 27	Portland. Rain.	Temp.	Wind.	Weather.	Red Bluff. Rain.	Temp.	Wind.	Weather.	Sacramento. Rain.	Temp.	Wind.	Weather.	S. Francisco. Rain.	Temp.	Wind.	Weather.	Los Angeles. Rain.	Temp.	Wind.	Weather.	San Diego. Rain.	Temp.	Wind.	Weather.
Thursday	.00	58	NW	Cl.	.00	77	N	Cl.	.00	73	NW	Cl.	.00	72	NW	Cl.	.00	77	W	Cl.	.00	68	W	Cl.
Friday	.00	63	NW	Cl.	.00	80	S	Fr.	.00	75	S W	Cy.	.00	64	W	Cy.	.00	86	W	Cl.	.00	74	NW	Cl.
Saturday	.00	63	NW	Fr.	.00	80	E	Fr.	.00	73	NW	Cl.	.00	60	W	Cl.	.00	80	W	Fr.	.00	68	W	Cy.
Sunday	.00	62	NW	Cl.	.—	54	N	Cy.	.—	60	S	Cy	.00	56	W	Cy.	.—	64	S	Cy.	.00	66	S	Cy.
Monday	.00	72	E	Cl.	.10	69	S	Cl.	.01	66	S W	Cl.	.—	61	N E	Cl.	.42	62	S	Cy.	.44	66	S W	Cy.
Tuesday	.00	73	E	Cl.	.00	68	S	Cy.	.01	62	S	Cy.	.01	59	S W	LR.	.40	68	S W	Fr.	.37	68	S W	Cl.
Wednesday	.00	56	S	Cy.	.00	72	N	Cl.	.01	66	NW	Cl.	.—	60	NW	Cl.	.00	73	W	Cl.	.00	66	W	Cl.
Totals	.00				10				03				.01				.82				81			

EXPLANATION.—Cl. for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature wind and weather at 12:00 M. (Pacific Staudard time), with amount of rainfall in the preceding 24 hours.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Apr. 9.		WEEK ENDING Apr. 15.		WEEK ENDING Apr. 23.		WEEK ENDING Apr. 30.	
Alpha	.25	1.50	1.00	1.50	1.00	1.60	.90	1.05
Alta	.30	.40	.30	.65	.25	.55	.20	.30
Andes	.35	.40	.40	.50	.30	.50	.30	.40
Argenta	....	....	....	....	....	....	....	....
Belcher	.90	1.10	1.00	1.45	....	1.50	....	1.00
Belding	....	....	....	....	....	....	....	....
Best & Belcher	1.50	1.95	1.90	2.80	1.85	3.20	1.85	2.00
Bullion	.35	.60	.40	.70	.40	.60	.30	.40
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	.15	....	....	....	....	....	....
Bodie Cou	1.55	1.75	1.40	1.60	1.40	1.60	1.50	1.60
Benton	....	.15	.10	.15	.10	.15	.05	.10
Bodie Tunnel	....	....	....	.25	....	....	....	....
Bulwer	.35	.40	.30	.33	....	.35	.25	.30
California	.65	.95	.90	1.15	.60	3.70	.70	.90
Challenge	....	.25	.15	.40	....	.15	....	....
Champion	....	....	....	....	....	....	....	....
Chollar	2.70	3.30	3.15	4.75	1.40	4.25	1.25	1.55
Confidence	....	....	1.25	1.50	....	1.15	....	1.40
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.65	.95	.90	1.15	.60	3.70	.70	.90
Con. Pacific	....	.65	....	....	....	....	....	....
Crown Point	1.00	1.25	1.10	1.90	1.25	1.75	1.20	1.65
Day	....	....	....	....	....	....	....	....
Eureka Con	4.50	4.60	....	4.25	....	5.25	5.50	7.88
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	.30	.35	.35	.45	.35	.40	....	.20
Grand Prize	....	....	....	....	....	....	....	....
Gould & Curry	1.00	1.90	1.90	2.85	1.25	2.60	1.15	1.55
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	5.05	10.50	5.77	12.00	4.10	11.75	4.50	6.50
Holmes	....	4.75	....	4.50	....	4.00	3.65	3.75
Independence	....	....	....	....	....	....	....	....
Julia	....	....	.15	.20	....	.10	.05	.10
Justice	.20	.30	.25	.40	....	....	....	.15
Martin White	....	....	.45	.60	....	1.40	....	.45
Mono	1.10	1.20	.90	1.10	1.15	1.40	1.10	1.50
Mexican	.70	.80	1.00	1.55	.55	1.35	.60	.65
Mt. Diablo	3.00	3.95	....	4.00	....	....	....	3.80
Northern Belle	....	....	....	....	....	....	....	....
Navajo	1.05	1.10	1.00	1.05	.90	.95	.90	1.05
North Belle Isle	....	.15	....	....	....	....	....	.10
Occidental	1.25	2.10	1.60	2.75	.40	1.80	1.30	1.55
Ophir	.70	.80	.95	1.60	.20	1.25	.50	.65
Overman	.25	.40	.35	.40	.20	.35	.10	.15
Potosi	1.25	1.55	1.30	2.05	.70	1.75	.50	.65
Pinal Cou	....	....	....	....	....	....	....	....
Savage	3.15	4.40	3.10	6.25	2.00	6.00	2.60	3.40
Sag. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	.85	1.00	1.15	2.00	.70	1.50	.80	.90
Silver Hill	....	.10	....	.10	.05	.10	....	....
Silver King	....	3.70	2.60	5.00	....	....	....	....
Scorpion	.15	.20	.20	.30	.15	.28	.10	.15
Syndicate	.45	.50	....	.40	.35	.40	....	.25
Tioga	....	....	....	....	....	....	....	....
Union Cou	.70	.85	.95	1.70	.50	.65	.45	.55
Utah	.70	1.10	1.10	2.05	1.00	1.40	....	....
Yellow Jacket	1.80	2.40	1.80	2.35	2.05	2.90	2.10	2.65
....	....	....	....	....	....	....	....	....

Our Agents.

OUR FRIENDS can do much in ald of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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GEO. MCDOWELL—Santa Clara and Santa Cruz Co's.
G. W. INGALLS—Arizona.
M. S. PRIME—Alameda County.
MRS. OZIER—California.
W. H. H. HUSSEY—Contra Costa County.
F. W. SMITH, New Mexico and Arizona.
W. B. TURNER, California.
R. E. BUSH—Shasta, Tehama and Trinity Cos.
M. C. BAKER—Napa and Yolo Cos.

IN THE United States last year there were manufactured 758,137,900 pounds of nails.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING APRIL 21, 1885.

316,107.—ROCK DRILL—C. O. Barlow, Nevada City, Cal.

316,106.—ROCK DRILL—Barlow & Emery, Nevada City, Cal.

316,116.—CONCENTRATOR—J. E. Clayton, Salt Lake City, U. T.

316,350.—SEWING MACHINE—Fisher & Hart, S. F.

316,256.—TRACE-BUCKLE—D. G. Gay, Pleasant Hill, Or.

316,141.—SOD-PULVERIZER—A. L. Gordon, Helix, Or.

316,035.—COAL-HOD—H. C. Hinman, Oakland, Cal.

316,049.—PUMP—Wm. C. McClay, Santa Ana, Cal.

316,164.—CULTIVATOR—S. A. Moulton, San Jose, Cal.

316,078.—WINDMILL—W. O. Swinnerton, San Jose, Cal.

316,315.—GATE—L. D. Wade, Puyallap, W. T.

4,428.—TRADE-MARK—D. F. Fryer, Oroville, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SEWING MACHINE.—Alfred A. Fisher and Albert Hart. Brooklyn, N. Y. No. 316,350. Dated, April 21, 1885. These improvements consist in means, operated by the thread of ths machine, for throwing the power device out of gear with the sswing machine upon the passage of a knot in said thread, whereby the machins is automatically stopped.

WINDMILL.—Wm. O. Swinnerton. San Jose. No. 316,078. Dated, April 21, 1885. This improvement consists mainly in a peculiar device for throwing the wheel out of the wind, a supporting frame or tail hinged to ths main or wheel frams, and an arm connecting the wheel frame with the rotary vane. It further consists in a novel construction of the wheel and certain details of construction.

PUMP.—Wm. C. McClay, Santa Ana, Los Angeles county. No. 316,049. Dated April 21, 1885. This invention is in that class of pumps in which such an arrangement of several pumps is made that ths work of one has a tendency to relisvs that of the othsr hy reason of effecting a halance between them. The invention consists, primarily, in a pump having a stationery piston and a reciprocating oylinder provided with suitable valves and a discharge pipe; and it consists further of the arrangement of two pumps of this character in a manner which will enable one to halance the othsr, so that the power necessary for operating them is reduced to a minimum.

MACHINE ROCK DRILL.—Charlss O. Barlow, Nevada City, assignor of a portion to Geo. T. Emery and J. W. Sprague of same place and Richard H. Lane, of N. Y. No. 316,107. Dated April 21, 1885. The improvement is in that class of drills in which mechanism is employed to deliver a striking or percussion hlow. The improvement consists primarily in delivering the hlow directly upon the head of the drill-bit, and consequently a mechanism for holding the hit, receiving and controlling its rehound from the rock, and holding it to ths rock again, mechanism for rotating it and mechanism for delivering the hlow. It consists further in various devices hy which these results are accomplshed, and also in a device by which the frame or har carrying the drill and driving mechanism is detatched from the feed screw and adapted to he moved hack rapidly.

POWER ROCK DRILL.—Chas. O. Barlow and Geo. T. Emery, Nevada City, assignors of one-half interest to J. W. Sprague, of same place, and Richard H. Lane, of New York. No. 316,106. Dated April 21, 1885. The invention relates to the class of power rock drils in which a column supports a cross-har on which is suspended the body of the machine carrying ths drill, the hammer and meana for vihrating the hammer and rotating he drill. The improvements consists in a steam-engine as a source of power formed with and carried by the body-har of the machine, and connected with the driving shaft which operates the hammer; in a novel mechanism for vihrating the hammer, a pecubar drill and mechanism for operating it, and meana for introducing a continuous aupply near the hottom of the hole to wash out the pulp.

INSERTIBLE SAW TOOTH.—Nathan W. Spaulding, S. F., No. 315,853. Dated April 14, 1885. This improvement in insertihle sawteeth for circular saws in the employment of an independent removahle point or bit-holder, and is a novel metbod of securing these points firmly, and at the same time, so that thsy may he easily removed. The hit-holder ia formed like the hody of the tooth, this hit-holder heing

formed independently of the saw-plate, and having grooves which form V-shaped tongues or projections, into which it is inserted in the saw-plate, and wherein it is locked by any suitable device. The cutting-tooth or bit is formed in the manner similar to that patented by Mr. Spaulding, in 1883, and is locked or secured in the socket, which is made in the bit-holder, by means of a sliding key, which is grooved upon the back, so as to fit a corresponding tongue on the edge of the socket. The meeting edges of the bit and the sliding-key are also suitably tongued and grooved, so as to insure their being held in place without any chance of self-motion. In Mr. Spaulding's former patent the sliding-key was formed with a thin elastic extension at the rear end, having an upwardly turned point to engage with notches or serrations upon the back part of the socket extension of the bit-holder, so as to prevent the key slipping out while in use. In the present invention Mr. Spaulding has a key having an extension, which projects backward in line with the upper part and enters a narrow slot or extension of the bit-socket, which is formed directly in the rear of it. The rear part of the extension has a lug which projects downward so as to rest upon the bottom of the socket into which it passes, and thus leaves a narrow slot between the lug and the body of the sliding-key, which admits of a tool being introduced for the purpose of driving the key out when it is necessary to remove the bit. In order to retain the key in its place, a hold or slot is formed, one-half of which is made in the upper part of the extension of the key, and the other half or the upper part of the socket and corresponding with it, so that a transverse rivet or key may be driven into the hole there formed, thus locking the sliding-key securely in place. The key or rivet is of soft metal and sets in a countersunk hole when headed down. This rivet must be driven out before the key can be removed.

Bullion Shipments.

Lexington (Montana), April 25, $20,256; Zelia, 20, $1,568; Clark & Larabie, $4,880; Alice, 20, $16,120; Moulton, 22, $19,200; Alice, 23, $18,464; Clark & Larabie, 25, $332; Alice, 25, $18,464; Christy, 22, $1,426; Hanauer, 22, $5,110; Crescent, 22, 2,000; Queen of the Hills, 22, $1,350; Germania, 23, $4,551; Queen of the Hills, 23, $1,400; Hanauer, 23, $2,700; 24, $2,600; Queen of the Hills, 24, $1,300; Orlano, 25, $18,232; Christy, 25, $1,550; Vienna, 25, $1,950; Hanauer, 25, $2,500; Queen of the Hills, 25, $1,500; Vienna, 26, $3,770; Hanauer, 26, $2,400; Germania, 24, $1,967; 25, $2,129. The banks of Salt Lake City report the receipt for the week ending April 22d, inclusive, of $78,095.07 in bullion and $12,800 in ore, a total of $90,895 07.

Mining Share Market.

The market still remains rather active though prices have not been well sustained this week. The volume of business, however, is not large and there do not appear to be many "outsiders" interested. Should the hopes of the managers of the Hale and Norcross be fulfilled and a good body of ore struck, it is probable that an old-time excitement will result. The latest news from the Hale and Norcross is that west cross-cut No. 4 on the 2,900 level is still in good ore. On the 3,000 level they are now drifting north in ore of good quality.

Books for Miners and Millmen.

KUSTEL'S CONCENTRATION OF ORES (of all kinds), including the Chlorination Process for gold-bearing sulphurets, arseniurets, and gold and silver ores generally, with 120 lithographic diagrams. 1867. This work is unequaled by any other published embracing the subjects treated. Postpaid, $7.50. Printed and sold by Dewey & Co., S. F.

KUSTEL'S ROASTING OF GOLD AND SILVER ORES (Second Edition, 1880), and the Extraction of their Respective Metals without Quicksilver. Illustrated. 150 pages. A valuable and carefully written work. Postpaid, $3. Sold by Dewey & Co., S. F.

AARON'S LEACHING GOLD AND SILVER ORES, the most complete hand-book on the subject extant; 164 pages octavo. Illustrated by 12 lithographic engravings and four wood cuts. Fully indexed. Plainly written for practical men. In cloth, $3. Sold by Dewey & Co., S. F.

PHILLIPS'S EXPLORERS' AND ASSAYERS' COMPANION (Third edition). Price of Vol. 1, postpaid, $6. Sold by Dewey & Co., S. F.

THE EXPLORERS', MINERS' AND METALLURGISTS' COMPANION, by J. S. Phillips, M. E., comprising a practical exposition of the Various Departments of Exploration, Mining, Engineering, Assaying and Metallurgy, containing 672 Pages and 83 Engravings. Price, bound in cloth, $10.50. Sold by Dewey & Co., S. F.

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If any subscriber fails to receive this paper promptly after making due inquiries at the Postoffice, he is urgently requested to notify this office by *letter*, that we may send the missing papers, and, if possible, guard against further irregularities.

Market Reports.

Lumber at Wholesale.

Following is the combination wholesale price list of Lumber, dating from April 6, 1885:

Pine—Rough, $15 00; No. 2, $12 00; do do in lengths, $13.00; rough, 40 to 50 ft lengths, $16.00; do 50 to 60 ft, $17.00; T and G Flooring, 1x6, $26.00; do do 1¼x6, $28.00; do do 1x4, $28.00; do do No. 2, $21.00; Vertical Grain T and G Flooring, 1x6, $30.00; do do do 1¼x6, $32.00; Stepping, $37.50; Furring, 1x2, per lineal ft, ¾ c.

Redwood—Rough, $17.00; No. 2, $13.00; Surfaced, $30.00; do 1x8, $28.00; do, 1x6, $28.00; T and G, 6 in, 12 ft and over, $28.00; do do, 7 to 11 ft, $25 00; do do, under 7 ft, $20.00; Rustic, $30.00; do No. 2, $25.00; T and G Beaded, 12 ft and over, $30.00; do do, 7 to 11 ft, $25.00; do do, under 7 ft, $20.00; Siding ½ in, $22.50; Picket, fancy $25.00; do rough pointed, $15.00; do do square, $14.00; Battens, ¼x3 in, per lineal ft, ¾ c; Shingles, $2.00; Laths, 1½, $3.25; do 1½, $3.75; Dunnage Boards, less 5 per cent, delivered, $16.00.

Lumber at Retail.

Retail quotations for fir and spruce are as follows:

ROUGH MERCHANTABLE—(Ordinary sizes) to 40 feet 1 rig, per M ft, $23.50; Rough Merchantable, 1x6, Fencing, $22.50; do do, 1x4, do, $23.50; do do, 1x3, do, $24.50; do do, 1x4, odd lengths, $22.50; do do, 1x6, do $21.50; do No. 2, all sizes, $18.50; do Selected, $26.50; do Clear, other than for T and G and Stepping, $31.

[Rough Clear for T and G and Stepping $1 ₱M less than price of kind for which intended.]

Dressed T and G Flooring, 1x6, No. 1, vertical grain, ₱M ft, $38.50; Dressed T and G Flooring, 1x6, No. 1, $33.50; do do do, No. 2, $28.50; Dressed T and G Flooring, 1x3, 1x4, 1¼x4 and over, No. 1, vertical grain, $40.50; do do do, No. 1, $35.50; do do do, No. 2, $20.50; Dressed Stepping, No. 1, vertical grain, $42.50; do do, No. 1, $37.50; do do, No. 2, $28.50.

SPRUCE—Rough, Merchantable, ₱M ft, $21.50; do Clear $35; Clear Dressed (shelving), $40; Pickets (rough) board measure, $26.50; Furring, 1x2, per lineal ft, 1c; Laths, 1 and 1-½inch, ₱M, $3.50; 1½-inch, $4.

[N. B.—For all sizes over 14 inches, and lengths over 40 feet, extra rates].

Pine—Rough, $14.00; No. 2, $11.00; do do in lengths $12.00; rough, 40 to 50 ft lengths, $15.00; do 50 to 60 ft, $16.00; T and G Flooring, 1x6, $25 00; do do 1¼x6, $27.00; do do 1x4, $27.00; do do No. 2, $20.00; Vertical Grain T and G Flooring, 1x6, $28.00; do do do 1¼x6, 1x4, $30.00; Stepping, $35.00; Furring, 1x2, per lineal ft, 1c.

Redwood—Rough, $16 00; No. 2, $12.00; Surfaced, $30.00; do, 1x8, $28.00; do, 1x6, $23.00; T and G, 0 in. 12 ft and over, $28.00; do do, 7 to 11 ft, $25.00; do do, under 7 ft, $20.00; Rustic, $30.00; do No. 2, $25.00; T and G Beaded, 12 ft and over, $30.00; do do, 7 to 11 ft, $25.00; do do, under 7 ft, $20.00; Siding, ½ in, $22 50; Picket, fancy, $25.00; do, rough pointed, $15.00; do do, square, $14.00; Battens, ¼x3 in, per lineal ft, ¾ c.; Shingles, $2.00; Laths, 1½, $3 25; do 1½, $3.75; Dunnage Boards, less 5 per cent, delivered, $16.00.

Nails.

We give the price list of the Pacific Iron and Nail Company.

FENCE AND BRAD.—10d to 60d, $2.90: 8d and 9d, $3.00; 6d and 7d, $3.25 4d and 5d, $3.50; 3d, $4.25; 2d, $5.50

BARRELS.—¾ inch, $6.75; ½ inch, $5.75; 1 inch, $5.25; 1¼ inch, $4.50; 1½ inch, $4.25; 1¾ inch, $3.75; 1½ inch, $3.50.

LINING.—¾ inch, $7.25; ½ inch, $8.75.

TOBACCO.—10d, $3.25 8d, $3.50; 6d to 7d, $3.75.

CLINCH.—6d to 30d, $4.50.

SLATING.—5d, $3.75; 4d, $3.75; 3d, $4.50; 2d, $5.75.

FINISHING.—2d, 1 inch, $8.75; 3d, 1½ inch, $6.75; 4d, 1½ to 1¾ inch, $4.50; 6d, 2 inch, $4.25; 8d, 2½ inch, $4.00; 10d, 1 inch and over, $3.75.

CASING AND BOX.—10d to 30d, $3.50; 8d, $3.75; 6d, $8.00; 4d, $4.25; 3d, $5.25.

FINE BLIND.—4d, $4.50; 3d, $5.75; 2d, $6 50

CUT SPIKES.—All sizes, $3.00

BOAT SPIKES.—All sizes, $3.50.

Each half keg 10 cents extra.

TERMS.—Note or acceptance at 60 days with current rate of Exchange on S. F., or a discount of 2 per cent for cash, if remitted within 10 days from date of invoice.

All accounts when due subject to sight draft without notice.

An abatement of 10 cents per keg will be allowed upon orders of 200 kegs or over.

Building Material.

Lime, per barrel, $1.50@$1.60. Plaster, $2.75–3.00. Eastern Plaster, $3.00–3.25. Rosendale Cement, $2.10–2.25. Portland Cement, $3.50–3.75. Fire Brick, per 1,000, $30 @ $40, according to brand; hard, $9.00; red, $8.00; oft, $7.00@7.50; face, $25.00.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, Apr. 30, 1885.

ANTIMONY—Per pound	@	—
Hallet's	12 @	—
Cookson's	13 @	—
BORAX—Refined	7 @	8½
IRON—Glengarnock ton	25 00 @	—
Eglinton, ton	23 50 @	—
American Soft, ton	27 00 @	—
Oregon Pig, ton	— @	—
Clipper Gap, Nos. 1 & 4	25 00 @	30 00
Clay Lane White	26 00 @	—
Shotts, No. 1	26 00 @	—
STEEL—English, lb	15 @	25
Black Diamond, ordinary sizes	13 @	—
Plow	6 @	8
Machinery	10 @	12
Sanderso i Bros	13 @	—
COPPER—		
Braziers' sizes	— @	25
Fire-box sheets	28 @	—
Bolt	22 @	—
Yellow Metal	14 @	15
Ingot	14 @	15
LEAD—Pig	3½@	3¾
Bar	5 @	—
Pipe	7 @	—
Sheet	8 @	—
Shot, discount 10% on 500 bag Drop, ₱ bag	1 85 @	—
Buck, ₱ bag	2 05 @	—
Chilled, do	2 25 @	—
TINPLATE—Oldcastle	5 25 @	6 00
Charcoal	5 75 @	6 75
Coke	5 25 @	6 50
Roofing	6 25 @	13 00
ZINC—German	9 @	10
Sheet, 7x3 ft, 7 to 10 lb, less the cask	9 @	10
QUICKSILVER—By the flask	33 50	
Flasks, new	1 05 @	—
Flasks, old	85 @	—
NEW YORK PRICES—		
California Borax, refined	8 @	8½
Pig Iron, American	17 00 @	18 00
Quicksilver	43 @	—
Lead	3 70 @	—
Copper	11½@	—
Tin	18½@	—
Bar Silver	1 08@	—

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

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Our intimate knowledge of the various inventions of this coast, and long practice in patent business, enable us to abundantly satisfy our patrons; and our success and business are constantly increasing.

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Confidential.

We take great pains to preserve secrecy in all confidential matters, and applicants for patents can rest assured that their communications and business transactions will be held strictly confidential by us. Circulars of information to inventors, free.

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Our long experience in obtaining patents for Inventors on this Coast has familiarized us with the character of most of the inventions already patented; hence we are frequently able to save our patrons the cost of a fruitless application by pointing to them the same thing already covered by a patent. We are always free to advise applicants of any knowledge we have of previous applicants which will interfere with their obtaining a patent.

We invite the acquaintance of all parties connected with inventions and patent right business, believing that the mutual conference of legitimate business and professional men is mutual gain. Parties in doubt in regard to their rights as assignees of patents or purchasers of patented articles, can often receive advice of importance to them from a short call at our office.

Remittances of money, made by individual inventors to the Government, sometimes miscarry, and it has repeatedly happened that applicants have not only lost their money, but their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees intrusted to our agency.

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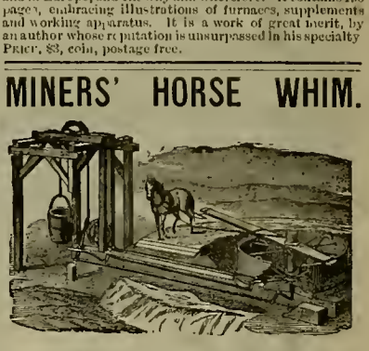
MINERS' HORSE WHIM.



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U. N. VAN BRUNT, Secretary.

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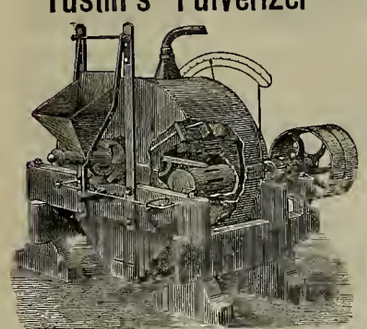

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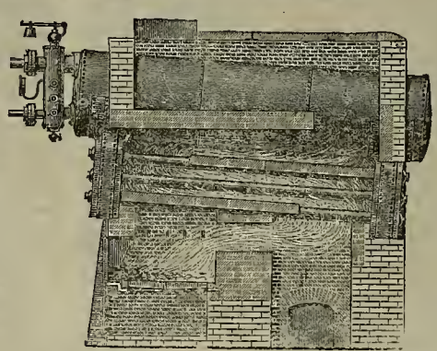

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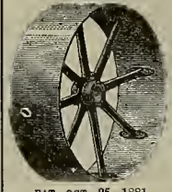

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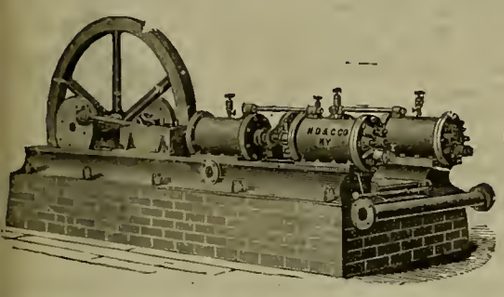

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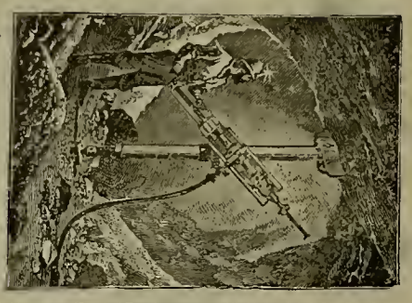

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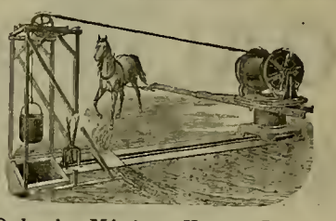

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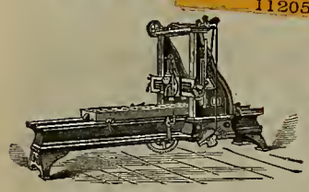

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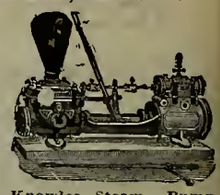

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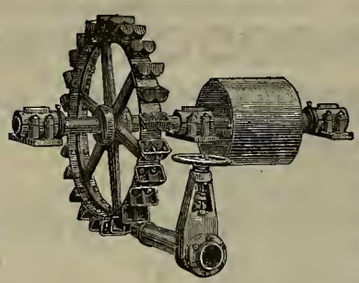

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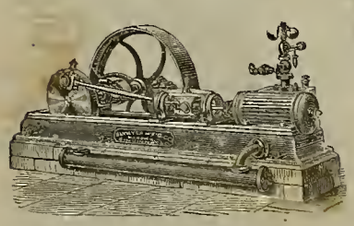

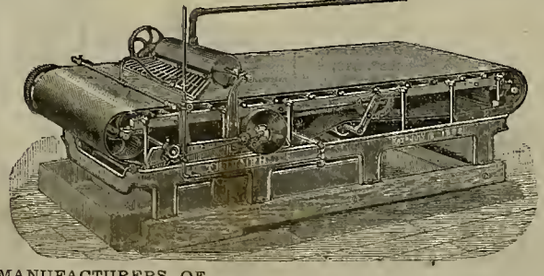

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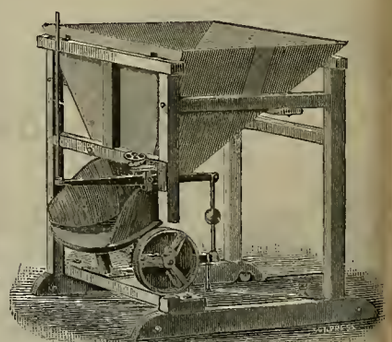

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, MAY 9, 1885. VOLUME XLXX Number 19.

The Wostinghouse Engine.

In the Press of November 1, 1884, the general features of the Westinghouse engine were referred to, and it was stated at the time that on a future occasion we should give some details of the mechanism of the engine, which presents several novel features of interest to mechanics. The engravings on this page show the construction, figure 1 representing a cross-section through shaft, and figure 2 a cross-section through valve.

The cylinders, *A*, *A*, are cast in one piece with the valve chamber, *B*, and are bolted to the top of the bed or crank case, *C*. The cylinder heads, *a*, *a*, cover the upper ends of the cylinders only, the lower ends being uncovered and opening directly into the chamber of the crank case. The pistons, *D*, *D*, are of the "trunk" form, double walled at the top to prevent condensation, open at the bottom, and carrying the hardened steel wrist pins, *b*, *b*. They are packed with four rings.

The connecting rods, *F*, *F*, are hollow, with ribs, and are subject to compression only; the cranks, *G*, *G*, balanced by the bobs, *x*, *x*, the crank pin, *P*, and the crank shaft, *H*, *H*, are all of steel, and may be removed by taking off the crank case head, *C*. The steel of which the cranks are made is cast under pressure and is a true steel; its quality is shown by the fact that it may be drawn out and tempered for a lathe tool.

The crank shaft bearings are in the form of removable shells, *d*, *d*, lined with Babbitt-metal which is expanded into place under a hydraulic pressure of 15 tons per square inch of surface. A chamber is formed in the flange of the shell *d*, enclosed by the cover *d'*. In this chamber, and revolving with the shaft, is the wiper, *W*, which takes up the oil as it works past the bearings and returns it through the tube, *e*, into the crank case, *C*. This renders all other lubrication unnecessary, and keeps the engine clean. A syphon overflow, with a funnel head, *n*, prevents any accumulation of water from rising above the level of the pipe *e*, and at the same time prevents the escape of oil. This overflow may be piped off at the hole, *o*, in the funnel head, as convenient. Collar washers, *t*, *t*, of bronze form the end bearings of the cranks. Lead washers, *r*, prevent the taper sleeves from being taken up so as to cause binding. A center bearing, *K*, bridges the crank case, and receives the thrust of the pistons. The bonnet, *h*, is removed to give access to the cranks.

The valve, *V*, is of the piston variety, of improved construction, being built up from a neck and spider heads of malleable iron, and rings, the whole bound together by a hollow valve bolt, *V'*.

The valve guide, *J*, serves also in lieu of a stuffing box against the exhaust steam contained in the passages above it. The valve guide, as well as the valve, and both pistons, are packed with simple sprung rings of cast-iron.

The valve stem, *m*, is keyed fast to the guide and grips the valve without binding between the nut at the upper end and the collar at the lower end, as shown. Water is supplied to the tank case through the pipe, *R*, *R*, and the level indicated on the funnel head of the overflow pipe, before mentioned. The water cannot rise too high, but care should be taken that it never falls so low as to be out of sight in the funnel head. The drip pipe and valve, *u*, if left open will drain the exhaust passages into the crank case, and so maintain the supply if the engine shows a tendency to lose water slowly from the crank-case. It should not be opened enough to allow the exhaust steam to blow through. Oil for the lubrication of all the internal parts may also be added through the pipe, *R*, but it is preferable to maintain a constant feed into the oil-cups, *f*, *f*, on the main bearings, whereby their proper lubrication is first assured, and the oil afterward returned into the case by the wipers for the benefit of the crank-pin and all the other bearings. No other oiling than through these cups is required. The front portion of the jacket conceals the oil reservoir, *O*, which fills the entire space between the cylinders and delivers to the oil-cups, *f*, *f*, by the concealed pipes and the cocks, *l*, *l*. The reservoir once filled at *q* will last a long time, and the entire lubrication of the engine (except the valves and cylinders which are lubricated from the steam pipe in the usual way), is thus introduced from one point. The cocks, *l*, *l*, should be kept open to allow a constant but slow drip of oil into the cup. Common black West Virginia oil, worth 12 to 13 cents per gallon, is not only the cheapest, but by all means the best. *M* and *N* are respectively the steam and exhaust connections. The standard band wheel is a combination pulley, *Z*, and fly-wheel, *Y*, cast together so that the pulley overhangs the main bearings throwing the line of belt strain well toward the center of the bearing, and taking the spring off from the shaft.

The automatic governor is located on the shaft, *H*, between the cranks, and actuates the valve direct without rock shafts or other mechanism. The device in its essential features is old and well proved. It is entirely enclosed, no portion being in view.

In the engine each cylinder is single, acting downward. The annular steam port, *p*, communicates with the top of one cylinder and *p'* with the top of the other. Steam entering at *M*, and surrounding the valve in the chamber, *s*, *s*, is admitted to the top of each cylinder alternately, as the inside edges of the valve uncover the ports, *p*, *p'*, and the compression is controlled by the outside edges of the valve in the usual way. The exhaust into the top of the valve chamber finds its way to the exhaust pipe through the hollow neck of the valve. In the cut (Fig 2) steam is being admitted to the port, *p*, and is being exhausted through the port, *p'*. Very high speed may be attained by this engine, making it specially useful for many purposes, as for electric lighting, marine purposes, etc. It is very compact, and the working parts are all enclosed, while at the same time the parts are readily accessible. A skilled engineer is not necessary to run it. About 1,500 of these engines are now at work in the United States. Sales have increased to about 60 engines per month, and the makers have received as high as a twelfth order from individuals who have used them. They are made from four to 160 horse-power, and all parts can be duplicated. A number of them are in use in this city and on this Coast. Parke & Lacy, No. 21 Fremont street, and The Berry & Place Machine Co. (Parke & Lacy, proprietors), No. 12 California street, are agents for this Coast, and have an engine set up and running at No. 21 Fremont street, where it can be examined by those interested. On a future occasion we shall describe some of the other peculiarities of this engine.

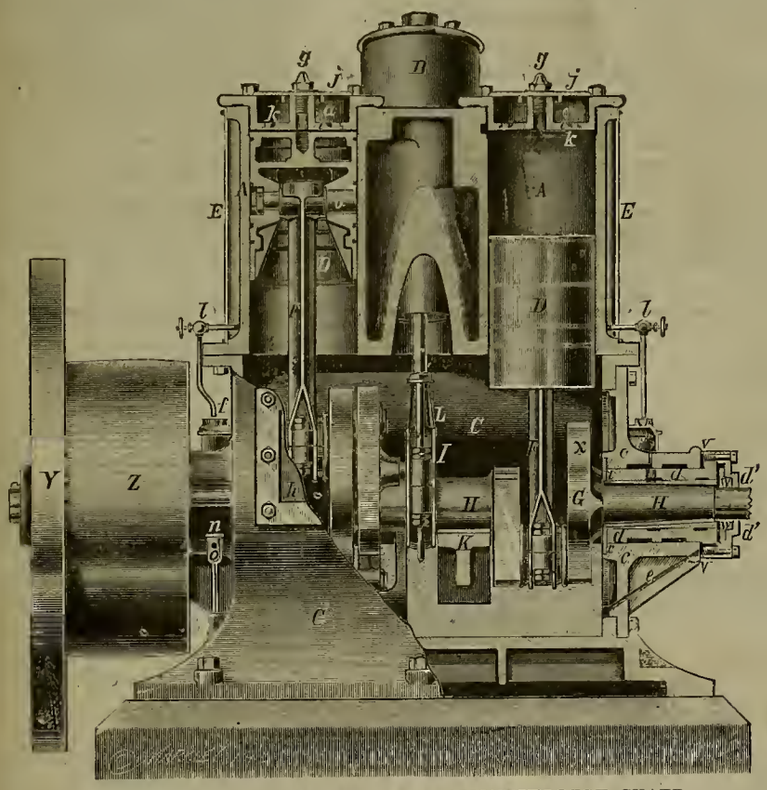

FIG. 1.—WESTINGHOUSE ENGINE—SECTION THROUGH SHAFT.

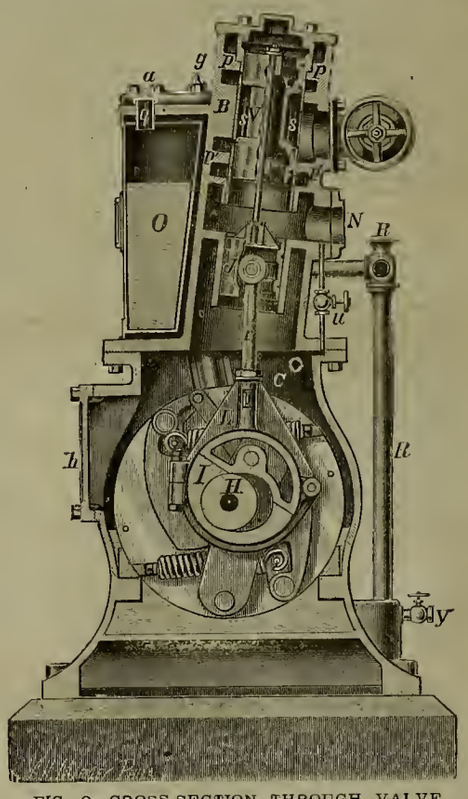

FIG. 2.—CROSS-SECTION THROUGH VALVE.

INCOMPETENT clerks are being weeded out of the Department in Washington

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

New Mexico.

[From our Traveling Correspondent.]

Georgetown District.

Nearly 25 miles nortb of Silver City is the lively little camp of Georgetown. As a steady bullion-producer this district has few equals, as well as a like scarcity of superiors. The reaction of a recent boom bas placed the camp on a solid business basis both in its mercantile and mine and milling interests. The town is orderly and prosperous; its inbabitants are cordial in their reception, and bospitable in their treatment of newcomers wbo propose to reside in or invest in tbe industries of the place. In addition to these commendable qualities they are honest and correct in their representations, a trait not often to be credited to a mining community. The town is prettily situated on the south side of a gently sloping bill; tbe mountain opposite raising more abruptly. On this mountain side are the principal mines of tbe district.

Formations and Ore Bodies.

The mineral-bearing ground is wbat is known as a horizontal-contact. The quartz and ore bodies occurring between lime and slate; the latter being the overhanging wall. The deposits are in chutes aud pockety chambers occurring continuously in the lime near the slate. At times rich bodies of ore have been taken from the lime a distance of 25 feet below the slate. Chloride, horn silver, lead, sulphurets and carbonate of silver is the character of these deposits. Chloride and horn silver to the extent of forty per cent; the balance a combination of the others. Tbe blanket-like mineral streak runs in between the lime and slate at a dip of about 34 degrees. The mineralization of the lime and quartz continues with depth varying in richness, the ore bodies occurring at intervals that indicate a permanency. The ores are free-milling, easy to concentrate and when concentrated run very high.

The Mines.

Commencing with tbe mines on which the most development has been done we have tbe the McGregor and tbe Commercial. Tbe former is owned by Malcolm and Alexander McGregor, two brothers who rank as pioneer minsrs of the camp. The Commercial is owned by Messrs. Smith & Tower, both residents of the district, and having a reputation as practical miners. A few Michigan people hold a small interest iu the Commercial. These two properties lie side by side. The development on both has been thorough and exteusive. The mineral belt covered by these mines is not only identical in character as well as similar in tbe grade of their ores. These two properties, in the hands of one management as practical and more venturesome tban eitber of the present owners, would be the nucleus of a big and lasting mine.

The McGregor.

The past history of the mine would read like a romance. The struggles of two brothers in their progress from poverty to affluence would make an interesting talc. The property has been worked for twelve years, and duriug that time has produced nearly $500,000. The brothers were compelled to sell stock in the mine for money with wbich to push development, and erect a mill for concentrating. Often during the time since the mine's discovery the two brothers consisted the entire force on the mine. The development has been conducted in a manner that is characteristic of the district. A more intricate net-work of tunnels and inclines would be difficult to imagine. Ore bodies of excellent grade have beeu passed through in many places in in search of richer deposits, that could be shipped without concentrating treatment. These and the many tons of low-grade ore on the dumps tbat can now be profitably treated hy the concentrator, will add to the output for a long time to come, even if no development was continued. During the present month three large and wonderfully rich beds of ore have been exposed, and their extent exceeds anything that has ever been opened up in the camp.

The Commercial.

The work done on this property shows not only a thorough knowledge of the peculiar formations, but a keen forcsightedness for the future utilization of every pound of ore that latter-day methods will successfully treat. The underground workings are conducted very much as the McGregor, only that the low-grade ore has been stored in tunnels and inclines and on dumps, hoisting only the high-grade and a portion of tbe low-grade; all waste dirt. Development has been pushed and the recent erection of modern labor-saviug machinery has put the mine in the lead as a finely equipped property. A two-compartment incline has been put down on the slate hanging wall a distance af 350 feet. Ths main lower levels of the entire mine are being pushed for a connection with this incline. The ore stored below will be taken out, and things will tben be in a shape to systematically and advantageously develop this already paying property. The development of a number of high-grade ore bodies recently at the lowest levels of the incline show that depth has not lessened the quantity or quality of the Commercial output.

Adjoining Properties.

The Naiad Queen and a number of other rich claims adjoin and are continuous on tbe mineral belt south of the McGregor and Commercial. These claims are owned hy the Mimbres Mining Company of New York. Tbe formations, ore deposits, manner of working and extent of delopment are similar to that of the McGregor aud Commercial. The company are working tbeir mines on the tribute system, compelling leases to treat the entire output at the stamp-mill of the company on tbe Mimbres rivsr, three miles below Georgetown. Any number of individual claims about the camp are pushing development and the shipment of ore and bullion is increasing in size aud value every week.

Driftings.

Three cars of ore recently shipped by the Commercial averaged $303, $325 and $365 per ton in silver and 18 per cent lead.

The stage fair to Silver City is $2.50.

The National hotel is the headquarters for tbe mining men of the district.

Georgetown mine-owners spend their money at home.

A 5-stamp mill witb Embry concentrators handle the McGregor ores. The concentrates run as higb as $500.

The freigbt rate from Wbitewater station, on tbe Deming and Silver City narrow gauge railroad to Socorro is $4.50 per ton on 100-oz. ore. From Georgetown to Wbitewater the freight is $4.50. Treatment at Socorro is $16 on ore and $20 on concentrates.

There are in tbe neigbborbood of 300 miners at work about Georgetown.

The San'a Rita copper mines between Silver City and Georgetown are not working at present.

Thers is very little base metal in the ores of this district.

In one of tbe lower levels of tbe McGregor a strong current of air comes out of a crack in the solid formation tbat appears to lead into a large cavity back under the mountaiu. The source of the supply is a mystery to all.

There must be all of 12,000 feet of development done on the McGregor mine.

The PRESS representative is indebted to Chas. Rosecrans for a handsome specimen of horn silver from the Naiad Queen.

Alex. McGregor is tbe leading assayer of ths camp. He is authority on the ores of the district.

Thos. P. Phehy, of Oakland, California, is running the Mimbres Mining Company's mill and mine under a lease. The mill is kept running steady.

The Mimbres mill is a 10 stamp combination (old Washoe) process, running eight amalgamating pans aud four settlers. Capacity, 20 tons per day.

The future pleasant relations between the Mimbres Mining Company and tbeir tribute workers will depend much upon the latter heing allowed to ship tbeir ore elsewhere for treatment.

Regular shipments hy the leading mines, prompt payment of wages and supply bills is establishing a good name and an extensive credit for Georgetown and its business men and mine-owners.

Frequent mention of this district will be made in the PRESS, and its increasing prosperity and new discoveries noted.

The Mogollon Mines.

This rich and recently discovered district is in the heart of the Mogollon mountains, nearly 90 miles north-west from Silver City and is in Socorro county. Silver City is the shipping point. The road, for a distance of nearly 80 miles, is an excellent one. Alma is the nearest valley town to tbs mines. From Alma the narrow road follows up Clear Creek canyon a distance of eight miles, in many places using the bed of the stream for ths road. Nearing the camp the size of the canyon grows smaller aud smaller; in a number of places blasting has been doue to make a passage-way for wagons. The mountains tower nearly perpendicular on each side in fantastic shapes; ths variegated colors in the fierce glow of a midday sun or the shadowy, towering peaks that loom, apparently, into the very skies on a moonlight night, baffles description. The grandeur of Colorado's celebrated Royal Gorge pales before the sublimity and natural beautics of this out-of-the-way but wouderful pathway of Clear creek's road to the valley of the San Francisco river.

The Camp of Cooney.

For ovsr a mile the cabins and rudely constructed business bouses of Cooney cling to the mountain's base almost on a level with the swiftly dasbing waters of tbe creek. Excavation for the rear end of the house and piling for the front being tbe order of most of the buildings. As yet the camp is small, and considering its age, remote location and a rough following of gamblsrs and sporting characters that exist in all new camps, the place is exceptionally orderly. Mitchell & Drew, two Arkansas boys, are the merchants of the place; they have no opposition and are growing wealthy accordingly. Tbe camp bas a reputation for richness and prosperity beyond its due. Outsids of a few stock compauies' property tbere is nothing to justify any great boom. Thers is no question as to its lasting and substantial qualities as a mining camp, for capital and enterprise eombined outside of this place would be like hundreds of other good camps now lying idle for want of capital.

The Mines.

The Silver Bar mine, better known as the "Cooney," is the leading mine, so far as development and output is concerned. Tbe mine was discovered by J. C. Cooney, a pioneer miner, wbo was killed by tbe Indians near tbe camp wbich now bears his name. His beirs and a number of Iowa capitalists now own the property. The mountains on both sides of the creek, at the point where the vein crosses, raise abrubtly at an angle tbat is nearly perpendicular to a bigbt of nearly 1,800 feet. A 700-foot tunnel on the vein from tbe creek level goes in ou a regular vein between two firm and well-defined walls. Above tbis, and connected by a 285 foot incline shaft, is a similar tunnel that goes into the hill an equal distance. Nsarly on tbe summit of the mountain, over the breast of the lower tunnel, a 60-foot shaft is down on ore. The following description of the extension of this mine will, owing to its lower location and superior surface indications, give the reader a better idea of the mines of the district:

The Silver Bar No 2.

This mine is the northern extension of the Silver Bar or "Cooney." Although not as extensively developed it bas every indication of proving a bigger bonanza tban tbe Cooney. John A. Miller, of Silver City, N. M., and San Francisco capitalists own the mine. Californians could not have thsir interests entrustcd to a more progressivs and capable man than they have in general manager John A. Miller. The claim is 600x1,200. The vein is so near a true fissure that it must be called a contact fissure; running nortb-west and south-east, occurring between two well-defined walls, tbe foot-wall being a dioritic porphyry, and the hanging wall a spatbic porphyry. The vein at all places exposed shows ore from wall to wall. The pay streak varying from 3 to 12 feet in width. The ore is a silver and copper-silver glance of the "peacock" variety.

Development.

The croppings of tbe vein for a distance of 100 feet or more bave been removed across the face of the east end, and a prettier sight tban the immense body of beautifully colored peacock ore from 4 to 12 feet wide, is seldom seen by miners. The veiu has a 50-foot shaft down on tbis ore from the surface. A tunnel from the bank of the creek has been run in on the east end of the vein, and at its breast a 30-foot shaft is down below the tunnel on ore. A tunnel driven in from the side-hill to tap the vein below the bottom of ths 50-foot shaft on the snrface, has cut the vein and shows it to be nearly 12 feet in width at this deptb; which is about 75 feet. A number of open cuts have exposed ore the most of wbich is higb-grade. The croppings of the vein show plainly across the face of the claim its entire length.

The Ores.

The following assays of the vein matter will properly illustrate the character and valus of the ores:

	Ounces silver
Average of ore on dump	136
Oxidized copper ore	71
Black oxide of copper	245
Copper pyrites	50
Blue carbonate of copper	166
Average of dump on platform	193
Peacock copper	153
Gray copper and pyrites	110
Gray and yellow copper	70
Copper oxide and sulphurets	72
Copper pyrites in quartz	42

The forgoing does not include any of the numerous returns from the unusually high-grade ore of the mine, but represents the general run of that which goes to make up the bulk of ths first-class or shipping grade of ore. An average of 50 odd assays, inclusive of everything from wall rock with no more than a trace, to ore carrying 1,000 ounces, was 120 ounces in silver.

Mining and Milling.

The extraction of ore from this mine is easily and cheaply accomplished. A concentrator with a capacity of 50 tons per day is being erected by J. B. White & Co., of San Francisco, under the supervision of B. O. Cutter. By this concentrator low-grade ores can he incrcased in value six times their worth on coming out of the mine. The concentrates wheu ready for shipment will run from 500 to 1,000 ounces; more probably will average the latter. President Miller expects to have the concentrator up aud running about June 1st, and after it once starts there is no question about its being supplied for years from the great vein of the Peacock. Shipments already mads havs resulted in excellent returns. The many ore dumps represent a large sum of money and will be realized on very sbortly. Owing to tbe narrowness of tbe canyon and the almost perpendicular incline of the mountain side much difficulty was experienced in making a place to pile the ore, causing almost a total suspeusion of work on tbis account. A large forcs of men are at work erecting ths concentrator, on the completion of which ths mins will be developed extensively and hy a management that knows its business.

Other Mines.

The Silver Bar No. 2 adjoins Miller's Silver Bar No. 1 on the north, and is owned hy a St. Louis company. The development is superintended by Joe Sheridan, and consists of a cross-cut tunnel ovsr 450 feet in length near tbs middle of tbe claim, which intersects ths vein 350 feet below the surface, sbowing at point of intersection seven feet of low-grade rock. Lateral drifts bave been run on tbe vein wbich show good indications of increase of value of ors. Immediately above the intersection of tbs tunnel a cut and shaft 35 feet deep has been made, sbowing a vein 12 fest wide with two feet of ore, wbich runs from 30 to 80 ounces silver and $60 to $100 gold. Other tunnels and shafts show up in a like manner.

The Tam O'Shantsr is owned by Joe E. Sberidan and lies adjacent to the Cooney mine, and carries the same cbaracter of ore But littls development has been done; it, bowever, shows well for the labor expended.

On Silver Creek.

The Keno mine shows well, with mill returns of ovsr 400 ounces of silver and two ounces of gold.

The Niles sbows a fine ore body; neitber claims have been developed to any extent worth mention.

Lambert's aviary, consisting of tbe Blue Bird, Red Bird, Black Bird, Late Bird, Early Bird, with all the balance of bis feathered songsters, makes a fine group of mines which show up finely in their gold and silver plumage, tbs Blue Bird claim having turned out some of the richest gold rock ever taken out in the Territory.

Tbe Buckhorn, owned by Eli Mader, sbows a fine vein of ore running from 50 to 200 ounces silver and $20 to $100 gold.

The Eureka, Mohawk, Colorado, Little Maud, Smuggler and Queen sbow well and have fair bodies of ore, but have no development sufficient to determine the extent of ors bodies.

On the Slayback claim, between Silver and Mineral creeks, J. E. Sheridan has an 80-foot sbaft showing an 8-foot vein of guld ore ruoning from $5 to $36 per ton.

Tailings.

The Copper King, on a vein running parallel with ths Miller, has a 4-foot ore body that will average about $50 per ton. A two-fifths interest has just been sold in tbis mine for $30,000.

Al. Louderbough, one of the most genial and accommodating of stage men, is proprietor of the Alma and Silver City stage line.

Cooney has a semi-weekly mail and is already clamoring for a daily.

A two days' ride, one night's lodging and $11 stage fare is the traveler's program from Silver City to Cooney.

Frank Viugoe, an old-time miuer, bas *charge de affairs* of the Cooney mine.

If capital will take out and concentrate the ore of the mines about this place and set big plants of machinery for the treatment of ores alone they will make money.

Wood and water are abundant.

Wages run from $2 to $3.50 per day.

Silver City checks arc used to pay off the miners with. These checks are taken for their full value hy business men and gamblers, principally the latter.

The ores of the Cooney are concentrated by a five-stamp mill and three Frue vans, the pulp ruuning from the battery over one and elevated above and run over the two remaining vans; the water used on these being hot instead of cold as generally used.

There is a rumor to the effect that the Cooney mine is being worked under a lease from the company by the preseut management.

The concentrates of the Miller and Cooney mill average way up, two cars netting $17,295.14.

The Argo smelting works, of Denver, get the most of ths Cooney ores.

A few more mines managed hy a get-up-and-get style like the Miller miue and Cooney will be a district "the observed of all observers."

J. C. Woodward, an old-time Californian, is superintendent of the Silver Bar No. 1.

The future progress of the Mogollon mine will be watched and a mention of her strides in a steady a regular producing camp noted by the MINING AND SCIENTIFIC PRESS.

F. W. S.

MECHANICAL PROGRESS.

Revolution in the Iron Trade—Making Steel Cheaply.

The latest discovery in metallurgy the Clapp-Griffiths process—appears to be attracting much attention. It is claimed that by it steel may be made at less cost than muck bar from pig-iron. The *Scientific American* refers to the matter as follows:

Early last year people about Pittsburgh had their curiosity much aroused by mysterious performances at the works of Oliver Brothers. A part of the establishment was carefully boarded and locked, and jealously guarded from all intrusion, and for a long time nobody was admitted. Indeed, while everybody wondered what was going on, and among iron-workers particularly a great deal of curiosity was excited, the secret was so well kept that the nature of the operation did not become known to anybody until in the last month, unless it was to those who had special information of the affairs and prospects of the great firm of Oliver Brothers after its suspension. But now, through papers submitted at the annual meeting of the American Institute of Engineers and publications in local journals, the public is assured that a new process for working iron has been thoroughly tested, and has not only met the scrutiny of experts, but has demonstrated its immense practical value.

Its effect upon the future wages of skilled iron-workers will probably be appreciated from the statement now made, that, while steel of a peculiarly excellent quality, and especially adapted to many uses in preference to malleable iron, has been produced in large quantities and placed upon the market, only one workman in the whole establishment has needed such skill or training as to receive wages averaging as much as $2.50 a day. By the new process, which is entitled the Clapp-Griffiths process, the silicon is so completely removed from the iron that, notwithstanding the presence of a proportion of phosphorus usually found fatal, steel of a high grade and of a remarkably useful quality is made. To the practical iron-worker, however, the most startling fact remains that the cost of this treatment is less than half the present cost of making the ordinary pig-iron into muck bar.

At the wages now paid in Pittsburg it is reckoned that it costs $12.75 per ton to make muck bar from pig-iron, but by the new process a metal far more useful, in better shape for handling, is produced at less waste, with a cost of only $6 per ton added to the cost of the pig. Moreover, it is shown that by applying the comparatively inexpensive plant required in this process in connection with ordinary blast furnaces, and taking the molten iron as it is required hot from the blast-furnace for treatment in the converter, the cost of producing the ton of steel will be only $3 or $4 more than the cost of producing the ton of iron.

"In the last year," adds the writer, "Oliver Brothers & Phillips have turned out many hundred tons of this metal in different forms, such as tacks, rivets, wire rods, telegraph wire, lightning rods, horse-shoe nails, pipe strips, plates, sheets, bars, angles, shovels, spades and stamping iron, which have given great satisfaction to consumers." The metal possesses, according to Captain W. R. Hunt, of Troy, who reported on the subject to the American Institute of Engineers, "an ever-constant welding property with great toughness." He further says: "I obtained steel with 54 per cent of phosphorous, and my surprise certainly did not decrease when I saw the test piece bend double, cold, and the metal work beautifully when hot." As respects the cost, Mr. Witherow, of New Castle, Pennsylvania, who has been associated with Mr. Oliver in the work, presented a paper in which he stated that careful account of expenses while making about 2,000 tons of this steel had been kept, and "including cost of the ferro-manganese, coke, and keeping up the plant, expenses for steam-power, labor, and everything connected with the process, it did not exceed $6.50 per ton over the price of the pig iron used." But, as he further showed, much greater economy can be had in a production of the steel blooms in direct connection with the blast-furnace.

Another great innovation in steel-making processes is announced in England, which, according to the London *Iron and Coal Trades Review*, will put an almost certain end to the malleable iron trade at once, as steel ingots could be made at far less cost than that at which puddled bars are now made. It will be observed that this process appears from the description to be like the one so successfully introduced in Pittsburg, at least in general results, and in probable economy of working.

Tools Past and Present.

There is a discussion going on among English machinists as to the past and present quality of tool steel. One intelligent writer says: "The demands of the engineer upon the makers of tool steel are more severe than ever before, and I venture to think that it was fortunate for the old melters that they knew nothing of turning and slotting steel castings, and hammered steel shafting, and they certainly never were expected to produce a steel capable of turning a 6 ft. long bar of hard Bessemer steel, 5 in. diam., down to 4 in. diam. at one cut and with one grinding, the tool sliding 1 in. for sixteen revolutions; and we hold that steel to do this is worth all the trouble and expense it costs to produce it."

EARLY COMPOUND ENGINES.—From particulars furnished by a correspondent of the *Journal* of the Franklin Institute it would seem that the compound engine is not so recent an invention as many suppose. "The first compound engines (he writes) are said to have been built by Mr. I. P. Allaire. As early as 1830 and 1832 there were on the Hudson river two steamboats with compound engines, the Swiftsure and Commerce. Their engines were of the upright square form, or cross-head pattern (very few of that form now in use, and none built), the high-pressure cylinder being forward and the low-pressure being abaft the paddle-wheel shaft, and both connected to it by cog-wheel gearing. About the same time the Post Boy, with similar machinery, built by Mr. Allaire, was sent to New Orleans. In the machinery of the above steamers the exhaust steam of the high pressure cylinder passed directly to the low-pressure cylinder without the intervention of valves or receiver between the two cylinders. The Swiftsure and Commerce were in use several years, and the machinery of the former was subsequently taken out and replaced by the ordinary beam engine. The compound engine, built by the late Erastus Smith, was of ordinary beam pattern, except that it had two steam cylinders, the high-pressure being within the low-pressure one. Their diameters were 37 and 80 inches, and stroke of piston 11 feet. This form has not been duplicated. The present compound engine has practically but little resemblance to those that preceded it, and is very much more economical."—*Ex.*

A FRANK ADMISSION.—Mr. Arthur Rigg, in a paper recently read before the English Society of Engineers, gives his countrymen some advice, in which he pays so high a compliment to this country that we ought, perhaps, not to accept without some reservation. Mr. Rigg said: "The idea of putting up everything cheaply not only saps the foundations of permanent success, but depreciates the quality of manufactured articles and destroys honest dealing. Thus some of our goods are being driven out of foreign markets and replaced by the more honest American productions. The writer considers it the most genuine patriotism to tell his countrymen the truth without disguise; believing that we can never lead the van of progress if we shut our eyes to what goes on in the world around. America is the best country for us to copy from, as it is inhabited by our own people; and there is more for an engineer to learn there than from any other place in the world. It welcomes every new invention, and the man of genius can hope for an early reward to his labor; while the engineer can freely obey the sound maxims—first, make sure of those general principles you intend to apply, then trust them implicitly; and finally, never be afraid to carry them out."

THE BEST STEAM BOILER.—A boiler will be so arranged that the globules of steam shall escape from beneath the water surface as near as possible to the point where the heat is greatest. Conversely the feed-water will be brought into the boiler at the point where the gas from the fire is the coolest, or close to the point where it finally escapes from the boiler tubes, or from the inclosure of the boiler walls into the chimney. The heat which remains in the gaseous current as it passes away is most effectively absorbed by contact with the coldest water, which, under all the conditions of the case it can possibly be made to encounter, and this is obviously the feed-water at or near the point of admission into the boiler. On the other hand, the steam as it escapes from the boiler should carry with it the largest fraction of heat that is possible, and this can be assured only, or most fully, by its contact up to the latest moment with the most highly heated part of the gaseous currents which are produced.—*Industrial World.*

A LADY MACHINIST.—A young lady of 17, studying at one of our large educational institutions, is pursuing a course of study that half a century ago would have marked her as an extraordinary example of independence. She has chosen the mechanic arts, and takes shop practice, studies machinery and its necessary accompaniments of science and mathematics, and in all branches acquits herself to the satisfaction of her teacher. Her object in pursuing a calling considered usually fit only for the masculine intellect, is to enable her to assist her father in his large manufactory at Rochester. At graduation she will be an accomplished machinist, and a valuable member of the firm.—*Boston Journal.*

TO PREVENT RADIATION.—A fabric for covering heated surfaces, so as to prevent radiation, has been patented by H. W. Johns, of New York City. It consists of a piece of heavy paper or sheathing, corrugated from end to end. Into the corrugations, rolls, ropes or hats are placed. These rolls or bats are retained in place by glue, cement or in other suitable manner. They are used on either one or both sides of the sheathing, and they are surrounded preferably by a sheet of asbestos, which protects them from the direct action of the heat. If desired, the rolls may be saturated with a hardening substance, such as silicate of soda.

SCIENTIFIC PROGRESS.

How Smoke is Formed.

The following are the views of a correspondent in London *Iron* on this subject:

"Hundreds of articles have been written and have been printed in newspapers, and many valuable lectures have been given on the important subject of smoke and its destructive properties, but I have never met a clear explanation as to how smoke is formed or what is the cause of smoke forming. In the most important book of the Smoke Abatement Exhibition even, where the highest talent of the day kindly gave valuable time to the subject, not a sentence is given as to how or in what way smoke is formed. I may almost go further, and say that it appears as if learned men did not agree, or had not made up their minds, if in certain cases smoke is formed, or if the smoke so formed is afterward consumed. I have a circular before me where the test of a boiler is given by a high authority, which states: 'The boiler either does not produce it, or it consumes its own smoke.' This will show that there is not yet a clear explanation before the public as to how smoke is formed, and I maintain that cause and effect ought to be properly understood before the necessary care in preventing it can be taken; therefore, a clear and most simple case may be here stated.

"It is well known to every one that when fresh coals are placed on a fire in an open fire-grate, smoke arises immediately; and the cause of this smoke is not very far to seek, as it will be easily understood that before the fresh coals were put upon the fire within the grate, the glowing coals radiated their heat and warmed the air above, and thereby enabled the rising gases at once to combine with the warmed air to produce combustion; but when the fresh coals are placed upon the fire they absorb the heat and the air above remains cold.

"By gases, I mean the gases arising from coals while on or near a fire; and it may not be known to every one that we do not burn coals, oils, tallow or wood, but only the gases arising therefrom. I can make this clear by the lighting of a candle, which will afford all the information required. By lighting the candle fire is set to the wick, which by its warmth melts a small quantity of tallow below, and this melted tallow is directly absorbed by the capillary tubes of the wick, and thereby so very finely and thinly distributed that the burning wick has heat enough to be absorbed by the small quantity of dissolved tallow to form the same into gases, and these gases burning, combined with the oxygen in the atmosphere, give the light of the candle. A similar process is going on in all other materials; but coal contains already about 17 per cent in weight of gases, which liberate themselves as soon as they get a little warm. The smaller the coal the more rapidly will the gases be liberated, so that in many cases only part of the gases are consumed.

"To return to the subject, the fact is that the volatile rising gases from the coal cannot combine with the cold air for combustion, still a combination does take place in the following way: The cold air, in the act of combination, absorbs a part of the warmth of the rising gases, which they cannot spare, and therefore must condense, so much so that small particles are formed, which aggregate and are called smoke, and, when collected, produced soot; but so long as these particles and gases are floating they cannot burn or produce combustion, as they are surrounded by a thin film of carbonic acid. It is only when collected and the acid is driven off that they burn rapidly.

"I have now shown that cold air is the cause of smoke, which may be greatly reduced by care. In the open fire-grate the existing fire ought to be drawn to the front of the grate, and the fresh coal placed behind or on the back of the fire. The fire in the front will then burn more rapidly, warm the air above, and prepare the rising gases for combustion. In this way smoke is diminished, as the gases from the coals at the back rise much more slowly than when placed upon the fire and the air partly warmed. The same process may be applied to kitcheners, thereby almost entirely preventing smoke after the first lighting. For stoves and boilers, warm air may be produced for the entire combustion of all gases."

Life Within Life.

The doctrine that the bodies of all the higher plants and animals are aggregations of myriads of minute, and in many respects independent, cells, had its origin some fifty years ago. Though now universally accepted by biologists as an essentially correct generalization, it has not yet become one of those scientific facts widely known to and accepted by the general educated public. To the "average man" the proposition that his body is a collection of thousands of microscopic masses of living matter, each of which lives its life in more or less harmony with the rest, but to a great extent without any reference to them, is an astounding one. He finds it nearly impossible to realize that in certain respects he is rather a nation than an individual; that his bodily life is the algebraical sum of the living and doing of hundreds of thousands of cells, much as the vitality and activity of a nation is the resultant of the actions of all its inhabitants. His physical life is to him an entity. In consequence there is nothing which the physiologist finds it harder to make comprehensible to the laity, than that a frog, as a complete animal, may be killed by destruction of its nervous system, yet most of its organs remain alive for hours; also the fact that it is not only possible in many cases to isolate particular organs or cells, keeping them alive for study after killing the rest of the plant or animal, but that this is even necessary, if the working of any complex organism is to be really understood. This popular ignorance, like all ignorance, has evil results. Much of the disquietude which many persons now feel in regard to physiological experiment is due to the fact that they do not realize that experiments on living hearts or muscles are usually carried out on animals which, as a whole, have been previously killed by destruction of the brain.—*Science.*

About Thermometers.

"Thermometers are curious instruments," said a dealer who was recently interviewed by a reporter. "Sometimes we find one that is all right at certain points and at others it will vary several degrees."

"What causes the variations?"

"The irregularities of the tube. They are frequently imperfect. At some point the tube may be too large, and when the mercury rises to that point it is depressed too much. The tubes have to be seasoned. This requires a year or two. Glass changes almost like wood. When it is new it expands, contracts and warps almost as badly as green wood. Frequently people come in and tell me that their thermometers registered 15 or 20 degrees below zero, when in fact it was only 10 or 12 degrees below. All cheap thermometers vary more or less."

"Where are the best thermometers made?"

"In London. There are two manufactories in this country—one at New Lebanon, N. Y., and the other at Rochester. The imported thermometers are too expensive for general use."

"How are they made?"

"The tube is blown into the size wanted, the top being left open. The bulb is heated to expel the air and while hot is inverted in a cup of mercury. As the tube cools the mercury is drawn up into the tube. The open end is then closed up and the tube placed on a scale. It is put into water of a known temperature and the point to which the mercury rises is marked. A number of tests of this sort are made before the instrument is placed on the market."

"How can we tell whether our thermometers are accurate?"

"There is at Harvard University a place for testing thermometers. They are carefully examined at various temperatures and any variation is marked. A certificate is given with every thermometer examined."

HOW TO IDENTIFY DIAMONDS.—The following is said to be an almost infallible test to distinguish a diamond, either from any imitation, however skillfully made, or from any other white stone: Prick a needle-hole through a card and look at it through the doubtful stone. If it is spurious, two holes will be seen distinctly on the card; if it is a diamond, but one; for there is no stone at all resembling a diamond that does not give a double reflection. This test is a delicate one, because it is difficult to see even a sharp, well-defined object through the diamond. This property is also made use of for determining an uncertain stone. If the finger is placed behind it and looked at through the stone with a magnifier, the grain of the skin will be plainly visible if the stone is not a diamond, but otherwise it will not be distinguished at all. A diamond in a solid setting may be identified in the same way; if genuine, the setting at the back cannot be distinguished, but if a false stone or strass either the foil or setting may be plainly seen.

INDESTRUCTIBLE LIFE.—A matter of surprise and wonder to those who witness it for the first time is the rousing to life of whole colonies of infusoria by the addition of a drop of water to a few grains of earth or dust. These microscopic organisms abound everywhere in water containing decomposing vegetable or animal matter, and some forms may, in a dried state, remain for months or even years apparently dead, to be revived when water is again supplied to them. Jabez Hogg has been experimenting during the past three years with one form of infusorial life—the rotifers or wheel animalcules—and has even kept dried specimens for a time at a temperature of 200 degrees Fahrenheit, and afterward exposed them to intense cold, neither process killing them nor greatly diminishing their vital powers. Mr. Hogg supposes that as the animal dries it shuts itself up like a telescope, its skin taking an egg-like shape, and that a secreting organ coats the body with a gelatinous envelope which protects it from further change.

DETERMINING DEATH.—A new agent for determining the question of apparent death is announced by an electrician, who says that in bodies in which life is not extinct the temperature rises upon the application of an electric current, but never in the case of actual death.

PENETRATING POWER OF PLANT ROOTS.—While excavating a well in York, Maine, the workmen found the roots of neighboring oak and hickory trees imbedded in the rock forty feet below the surface. In many instances they had formed cylindrical channels in the stone.

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:

Saturday Morning, May 9, 1885.

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Passing Events.

The starting up of the Parrott works at Butte, Montana, and of the Richmond works at Eureka, Nevada, are not only good indications for those camps, but may be considered as hopeful signs for the mining industry. Both these large works have been closed down for some months.

Since our last issue the whole tone of the news from Europe has been changed from a warlike to a peaceful nature, and the prospects now are that war will be averted.

Considerable attention is just now being turned to Southern Oregon by prospectors. The quartz interests of that section have long been neglected, but the probability now is that more prospecting will be done and some of the mines which have been found will be developed.

The northern counties of California are still attracting a large number of miners and prospectors, and the indications are that the regions thereabouts will be pretty well prospected during the summer.

The chlorination test of tailings that has been made in the Howell roaster at Bullionville has been highly satisfactory, Mr. Russell having leached them on a small scale up to 78 per cent. This test guarantees the erection of the large Stedefelt furnace.

ANOTHER discovery of gold is reported from the East. Fritztown, Pa., is the scene of the excitement this time, and, as usual, "the land on the farm where gold was found has risen greatly in price."

THE Comstock pay-rolls for April were $100,827.

SILVER seems to be going up slowly.

A Remarkable Meteor.

On Sunday evening, the 19th ult., while Mr. Fremont Morse, of the U. S. Coast Survey, C. W. Brewster and C. B. Hill were standing in the enclosure of the Davidson Observatory in this city, they noticed the sky suddenly light up and a magnificent meteor shot very rapidly from a point in Gemini toward the south-west borizon. The time was 11 h. 06 m. by 120th meridian time. Looking toward the west the path of the meteor was inclined about 20 degrees to the north of a perpendicular to the horizon, and its duration was about three-quarters of a second. But the most remarkable feature of the phenomenon was the persistence and character of the vivid train which remained about the center of its path. At 11 h. 06 m. this consisted of a line of light like a comet's tail, say 8 degrees in length and half a degree broad, situated just under the triangle of Cancer. Almost immediately the center began to fall to the south and at 11 h. 08 min. it had assumed a wave or snake-like form. This drawing out continued, until at 11 h. 09 m. it was a perfect letter V, and a few minutes later, at 11 h. 12 m. it still remained as a horizontal patch of hazy light, which slowly drifted toward the south, remaining in sight for probably nine or ten minutes from the first apparition.

These facts were communicated to the California Academy of Sciences at its last meeting by Mr. Hill; and Prof. Davidson also read a brief note concerning the April meteors. There is a periodicity and position of the meteors about April 20th which have given rise to much speculation as to the relation between this stream and the first comet of 1861. The characteristics of these meteors are their great brightness and their leaving persistent tails. The first comet of 1861 arrived at its descending node on the 20th of April and then passed only 214,000 miles within the orbit of the earth.

Although the period of the comet has been computed at 415 years, it is supposed to have been influenced in this orbit by one of the exterior planets. Hind suggests Saturn, and Kirkwood suggested Uranus (1873). Hind has gathered together several brilliant displays of the April meteors dating back before Christ, and bringing the dates up to 1803. From his computations he predicted a period of 27 years, and that we might expect a bright display in 1884. But the date of the previous displays are too far apart to warrant a specified period.

The display this year of several brilliant meteors on the 19th and 20th of April shows that the stream is persistent and maintains its characteristics.

Mining Department at the University.

The largest attendance upon the College of Mining in the University of California immediately followed the great mining developments on the Comstock. In fact the entire university temporarily profited by that development. To students in mining, certainly, most promising careers seemed to many at that time to be opening, and a greater number of young men sought to avail themselves of the opportunities offered in the College of Mining than presented themselves before or than have presented themselves since. Judgments formed during the excitement and over-confidence attending such rich developments, as well as those that followed the working out of bodies of ore that were thought to be inexhaustible, were doubtless in many cases hasty. When the bonanzas were worked out it seems to have been assumed as a matter of course that there was likely to be but little opportunity for the mining engineer or metallurgist. But the opposite conclusion would have been more legitimate.

The discovery of a large ore deposit, and of economical methods of working it, does not necessarily create a great demand for mining engineers and metallurgists. They are most needed after the rich and easily worked ores have been exhausted, and when the problem of profitably working low-grade or rebellious ores is to be solved; and when, also, expert judgments are needed to determine whether certain ore indications warrant the expenditure of considerable sums of money in testing the indications. New and valuable mining deposits await development, both in the United States and in Mexico, properties that in the development and working will require the constant service of the most competent engineers. It is probable, then, that there never was a time when the prospect for an educated mining engineer or metallurgist was better than to-day. It can hardly be doubted that better and more economical methods of working low-grade and rebellious ores will yet be discovered, and certainly no more creditable or inviting work could be desired by a student of mining or an expert metallurgist.

For training and instruction in such work excellent facilities are offered in the well-equipped laboratory of the mining department of the University. To the equipment already in use important additions are made as occasion offers. The laboratory practice of the last two years has consisted, in great part, in approved methods of assaying lead, gold, silver, antimony, copper, tin, nickel, cobalt, iron, and fuels. In this laboratory work, the students have, as far as possible, taken part. The departments of chemistry, civil engineering, mineralogy, etc., are adjuncts to the mining, for those pursuing a special course. Mr. S. B. Christy, who is in charge of the mining department, takes the greatest interest in his branch and would be glad to have larger classes than now attend.

It would seem that on this Coast when such good opportunities are offered there would be many young men who would desire to take the mining course at the University. In a mining country such as this there are plenty of openings for trained young men to commence work, where they can gain valuable experience. After passing through the mining school at the University they will be in a position to observe intelligently and in a short time be able to take charge of works.

Measuring Air Currents in Mines.

The practice of periodical observations of the anemometer, entered in a special register of the ventilation of the mine, is rendered obligatory and practiced throughout England. The object of the anemometrical measurements should not be merely to give information of the total volume of air at its entrance to or its exit from the mine, or at the bottom of the shafts, but especially the volumes circulating to advantage in a given district and even in a given working place. It is for such a purpose that they should be taken regularly. It is necessary to guard against erroneous indications which might result from inaccurate observations, especially on account of the variation of speeds in one and the same section of an airway where the operation takes place. These observations should be arranged in such a way as to give the mean speed with sufficient exactitude.

The most important of the appliances for control and supervision to be erected permanently is an appliance suitable for making known the volume of air at a point judiciously chosen. Among these appliances mention is made by the French Fire-damp Commission of that devised by M. Murgue and described by him in the monthly report of the Societe de l'Industrie Minerale (1880, p. 120), and the anemometrical tube of M. Bourdon. This last-named appliance may be made self-registering by combining it with instruments for measuring the diminution of pressure.

To have all these data necessary for a complete knowledge of the ventilation of a mine, it is necessary to know, besides the volume of air which circulates therein, the excess or diminution of pressure under which the ventilation is effected.

In mines ventilated by fans this measure by registering appliances is an easy matter and generally practiced. In mines ventilated by furnaces or naturally, it is possible quite as easily to measure and register, if it be desired, the diminution of pressure at the bottom of the shafts or adits, which serve as inlet or outlet airways, when these airways terminate at the same level, and when they are sufficiently near one to the other.

When this is not the case the only method would be to make the comparison of observations of barometers suitably installed and duly observed both underground and on the surface, a solution more theoretical than practical. In principle the continued observations of diminutions of pressure may supplement all direct measure of the speed of a fan; with any given appliance one of these quantities is at once deduced from the other. Nevertheless, there is interest and utility as regards the very inspection of the fan to provide every fan engine with a counter in addition. A counter, even self-registering can only give useful indications in connection with this subject if it permits of calculating the speed of the engine at any moment.

A totalizing counter is a simple appliance that keeps a check upon the engine-man—an appliance which will only be really useful if its readings be checked at any moment, at irregular but sufficiently frequent intervals. That variations of the thermometer should exert a capital influence on natural ventilation is very evident, since this kind of ventilation depends upon differences of temperature.

Sampling Ores.

The erection of large metallurgical establishments for the treatment of gold, silver, copper and lead ores, at railroad and geographical centers, where fuel and fluxes, together with proper ore mixtures, can be cheaply and constantly obtained at all seasons of the year, has led to the very general introduction of a system of "public sampling." By this system, the ores instead of being shipped direct to the mill or smelter, is sent to a public sampler, where it is crushed and sampled. Guarantee samples are sent to the different metallurgical establishments, and the ore is then sold to the highest bidder. The steadily increasing practice of leaving mines to working miners has also given a great impetus to the system of public sampling, These men will not employ a common agent and the public sampler meets their wants and renders the presence of the owner at the valuation and sale of the ore, wholly unnecessary. The system is also a benefit to the buyer. When the sampling and assaying is performed by a third party, the former endless disputes between miner and smelter are no longer possible. Moreover, instead of having to take all ore sent there, the metallurgical establishments need only bid on such ores as are required in their mixtures, the large variety of ores from which they have to select more than compensating for the increased cost.

Before the introduction of public sampling, the ore, after being crushed, was generally sampled by hand, either by taking every fifth or tenth shovelful by "quartering," or by the "split shovel."

Since large quantities of ore have now to be handled, and close competition has made cheaper methods of work an absolute necessity, mechanical sampling, in some form or other, has become almost universal. While the devices employed for this purpose exhibit an almost infinite variety of type, yet they all work upon the same general principles, viz.: by dividing or cutting out from a falling stream of ore, by means of narrow spouts, dividing flanges or traveling buckets, a certain percentage, which is taken to represent an average sample of the whole.

Many of the samplers exhibit a vast amount of ingenuity, and upon dry ore, crushed and screened to a uniform size, and perfectly free from strings, chips, rocks, etc., some of them will yield perfectly accurate results.

Unfortunately, however, these conditions are rarely realized in practice; and the result has been that both sellers and buyers have very often insisted on checking the work by means of hand-sampling. Even if the above objections did not occur, many of the samples would still give inaccurate results; since a stream of falling ore, either in a vertical or in an inclined spout, is never entirely homogeneous in all its parts, there being a constant tendency to a greater proportion of coarse, rapidly traveling particles in the center of the stream, and an excess of finer, slower moving particles on the edges. Consequently no part of the stream would exactly represent the average of the whole.

Again, where intercepting buckets are used, the coarse, heavy particles often rebound from the buckets and fall into the rejected ore, thereby rendering the sample inaccurate. Even the fine crushing and accurate sizing required by the best of these devices is a decided objection, if the ore is to be afterward treated in a shaft-furnace, where an undue proportion of fine stuff not only increases the loss in dust, but materially reduces the daily capacity of the furnace. These statements we take from a paper read recently before the American Institute of Mining Engineers, by D. W. Brunton, of Denver, Colorado, who has devised a new system, which is described in the PRESS of last week.

Work Accomplished by Miners.

It will be readily conceded that the miner of to-day is enabled to accomplish more work in a given time than the miner of 25 or 30 years back Not that the men themselves are physically superior, but that their appliances and tools are more perfectly adapted to the work, and experience has brought forward plans and systems greatly in advance of those in vogue years ago. On this Coast the miners are better paid for their labor than anywhere else, though in older regions where coal and iron mining prevail the wages have not increased with the increased result of the work. In Europe this is particularly the case. Among other things which are just now subjects of discussion among the French miners, it is contended that the average rate of wages now paid to colliers is really not higher than it was fifty years ago, even when the relative values of money are taken into account. In support of this contention it is argued that the miner now produces more than he did—that his labor, on account of increased skill, has become more productive; in other words, the miner of to-day is a more efficient workman than he of half a century back, and therefore earns more than the latter did.

In that country an elaborate set of tables has been prepared designed to show the annual output per man for a period of 30 years. There can be no doubt that, estimated in this way, a very marked increase in the efficiency can be shown; and if it could be made to appear with equal certainty that the improvement is due to greater skill in the men, the case would be satisfactorily made out. The greater productiveness may not be wholly, or even in part, attributable to defter handiwork, but to improved tools, the more extensive use of machinery and better systems of working. That these causes have operated largely in bringing about the improvement admits of no doubt, and it is highly probable that they alone have occasioned it. The employers hold that the gain is due to capital, not labor, and that the workman should consider himself sufficiently benefited by the saving of toil which these superior means occasion, and should not expect an increase of pay for better results of day's labor.

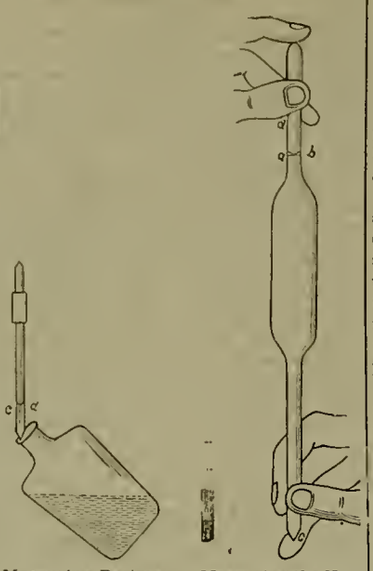
Measuring Solutions in Humid Assays of Silver.

In the PRESS last week we gave an extract from C. H. Aaron's new work on assaying, parts II and III (puhished by Dewey & Co., 252 Market street, S. F.), in which was described the method of standardizing the normal solution in the humid assay of silver bullion. This week, in continuing the subject of the volumetric assay, we take from Mr. Aaron's work what he says about measuring the normal solution, and measuring the decime solutions.

A solution of salt in water is made, of which 100 cubic centimeters will exactly precipitate 1,000 of pure silver, leaving neither salt nor silver in the liquid. This is the *normal* solution. The thousand used in this assay is either 10 grains or 1 gramme—the latter generally. Another solution of salt is made one-tenth as strong as the normal; consequently, one cubic centimeter of it precipitates one point of silver. This is the *decime salt solution*. A decime solution of silver is also prepared, of which one cubic centimeter contains one point of silver; consequently, the two decime solutions are equivalent volume for volume, each neutralizing the other. The cubic centimeter sign is c. c.

In measuring the decime solution a glass *pipette* containing 100 c. c. is used. The accompanying diagram and directions are from Mitchell. "Immerse the jet, *c*, of the pipette in the solution, apply the mouth to the upper orifice, and draw the liquid into *d*, above the circular mark, *a, b*. Dexterously apply the forefinger of one of the hands to this orifice, remove the pipette from the liquid and hold it as represented in the figure. The mark to *a b* is held on a line with the eye, and the surface of the solution allowed to descend until it forms a tangent with the plane, *a, b*. At this instant the jet, *c*, of the pipette is set at liberty by removing the finger, against which it had been pressed, and without otherwise changing the position of the hands, the contents are allowed to run into the bottle appropriated for that purpose (containing the assay) taking care to remove the pipette as soon as the stream stops."

"If, after having filled the pipette by aspiration there is any difficulty found in a sufficiently rapid application of the forefinger to the superior orifice to prevent the fall of the liquid below the mark *a b*, the pipette must be removed from the liquid, the orifice being closed by pressing the tongue against it; then apply the middle finger of one of the hands to the lower orifice, remove the tongue and apply the forefinger of the other hand to the larger orifice, previously wiped dry." The pipette should be rinsed with a little of the solution before being charged, and washed twice with water after use.



Measuring Decime Solution. Measuring the Normal Solution.

The decime solutions are measured in smaller pipettes gauged so that when filled to the mark *c, d*, (see diagram) they allow one c. c. to run freely, the small quantity of the solution remaining in the pipette not forming part of the c c. The decime salt solution is kept in a bottle closed by a cork which is traversed by the pipette firmly fixed in a hole bored for that purpose. The decime silver solution is kept in a bottle closed by a glass stopper. Quoting Mitchell again:

"To measure a thousandth ('point') with the pipette, the bottle is held with one hand and the pipette with the other. The pipette is taken from the solution after its upper orifice has been closed by the forefinger; the lower orifice is then inclined against the edge of the flask to remove the liquid, which without this precaution would remain there. The mark, *c, d*, is then raised to the level of the eye, and by a suitable pressure of the forefinger on the upper orifice, which may be obtained by giving the pipette a slight alternating circular movement between the fingers, the solution is allowed to run out gradually."

"The instant the concave surface of the liquid is at the level, *c d*, the pipette is firmly closed by pressure of the fore finger on its orifice, which is held above the bottle into which the solution is to be poured, and the forefinger removed so that it can be emptied. It is here necessary to remark that in order to regulate the slow and regular runnings of the liquid from the pipette, by the pressure of the forefinger, the latter ought to be neither too moist nor too dry; if too dry it will not perfectly close the orifice, even by strong pressure; if too moist it prevents the entrance of air, and the liquid will not run, or if it does it will be irregularly." This observation should not be lost sight of in the use of the large pipette. As it is often convenient to use several c c of either decime solution at once, the pipettes are graduated from one to five.

The Torsion Balance.

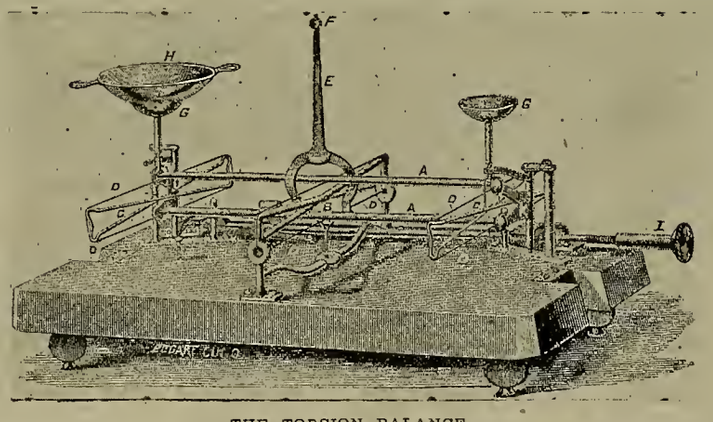
Chemists, physicists and others, whose occupations necessitate the use of fine scales, have heretofore regretted their inability to obtain any which would remain uniformly accurate.

The difference between the theoretical and actual results obtained in the ordinary balance (provided the pivot distances are exact) is mainly due to the frictional resistance between the knife-edges and their bearings. This frictional resistance, although reduced to a minimum in the finest scales when new, constantly increases, thereby decreasing their sensitiveness proportionately,

When examined under the microscope, neither the surface of the knife-edge nor that of its bearings ever appears perfectly smooth. Soft knife-edges are easily blunted, whereas hard ones are brittle and liable to crumble under the effects of over-load or shocks. Prof. F. A. Roeder for many years attempted to discover some means by which the knife-edge could be replaced with some device free from these objections. His experiments convinced him that a torsion-joint was best suited for the purpose. He communicated this conclusion to Alfred Springer, of Cincinnati, and they jointly developed a system which the latter gentleman described before the American Institute of Mining Engineers. A torsion wire had been used for the center of rotation prior to Prof. Roeder's invention, and it was found impossible to replace the terminal knife-edges with torsion-joints.

The use of a torsion-joint introduces a new element opposed to sensitiveness, namely, that of resstance to molecular displacement. In the scales manufactured by these gentlemen, according to size, thin wires of gold, or bands or rods of an elastic material are strongly tensioned over suitable frames (which themselves are thereby strengthened by being equally framed on all sides).

In the engraving, *A*, *A*, is the parallel compound beam. *B*, immovable center frame, carrying index and beam. *C*, *C*, movable frames carrying the pans. *D*, *D*, *D*, stretched gold wires over the frames, acting as central and terminal pivots. *E*, index. *F*, weight for the purpose of elevating the center of gravity. *G*, *G*, cups for pans. *H*, *H*, pans. *I*, arrest. *K*, *K*, support to receive the weight of the scale when not in use.



THE TORSION BALANCE.

The center frame, *B*, being attached to the base of the scales, is an immovable one. On the upper and lower wire, *D*, *D*, of this frame a compound parallel beam, *A*, *A*, is firmly attached. The ends of the beams are similarly attached to the wires of the movable cross-pieces, *C*, *C*. The purpose of the outer cross-pieces which carry the support for the pans is to allow them to descend in a vertical direction, thus keeping exact fulcrum distances. Every part of the system being firmly soldered, the whole construction is in reality but a single piece.

The resistance to molecular displacement is augmented by the tension at which the wires are held, and increases with the angle of displacement. This resistance to torsion is many times greater than the frictional resistance between the knife-edge and its bearings, but differs from the latter in this: that it does not vary with different loads, whereas the friction in the knife-edge increases with the load placed on the pans.

Now, if this torsional resistance be compensated in some suitable manner, it is perfectly evident that it will play no further role in the working of the scales. This nullification of torsional resistance is effected in a peculiar manner which they have found to be perfect for any arc of oscillation used in balances.

As a compensation to torsional resistance, they make use of a "poise," *F*, above the center of rotation, which has no effect upon the twisting of the wire as long as in the center, but according to the laws of gravity has an increasing effect in proportion as it moves from its neutral position. This increasing force in oscillation exactly counterbalances the increasing resisistance to molecular displacement, thus effecting an absolute nullification of the original torsional resistance in the wires when oscillating. The scales are now free not only from torsional resistance, but are absolutely frictionless.

For many purposes it is desirable to have less sensitive scales. When this is the case, the poise is simply lowered until the required sensitiveness is obtained. It has been asked whether the twistiog of the wires does not tend to break them. A careful observation will show that the wires are long and the arc of oscillation comparatively small; furthermore, every molecule partaking in the motion, no part of the wire undergoes much torsion. In fact, it is barely visible. Thus much for the smaller scales.

It will be readily understood that by moving one of the outer cross-pieces toward the center one, and the other away from it, we obtain the common steel-yard with its ends of unequal length; that is, a single multiplying lever, in which the knife-edges are replaced with torsion-joints. Furthermore, if the long end of this lever be attached by a similar cross-piece to the short end of another such lever, we get the effect of multiplying levers as used in platform and other large scales, but with this great difference, that the multiplication of the torsion-joints in contradistinction to the knife-edges does not increase the error due to friction.

All the levers, like the simple scale, act as one piece, and the poise can be placed over every center of rotation, or, if convenient, over a single one. It is preferred to place it over the last one in the system, thus decreasing in size proportionately to the multiplication of the levers. Both large and small scales constructed on this system are extremely sensitive and durable.

A New Concentrator.

Prof. J. E. Clayton, of Salt Lake City, has patented through the MINING and SCIENTIFIC PRESS patent agency an improved machine for concentrating slimes, tailings, sulphurets or other substances in which it is desired to separate the heavier from the lighter portions.

The machine consists in a circular pan having a hollow central cone with vertical slots through which the discharge of tailings may be made. A series of rings fit this cone by which the point of discharge may be raised or lowered; and there is a conoidal diaphram at the bottom of the pan with outwardly inclined perforations or jet-holes, through which water may be forced into the mass to be concentrated. The revolving hopper at the top has pipes which extend downward so as to deliver the material to be concentrated around the inner periphery of the conoidal bottom. The machine has a series of vertical rods having toes or scrapers at the bottom arranged with relation to each other so as to act successively in spiral lines upon the lower stratum of concentrates; and there are exterior slotted outlets for the discharge of the concentrated material, and a flat circular wheel or annular disk fitted to the bottom or lower end of the slotted outlets with corresponding holes or openings. There are means for moving it so as to open or close the outlets. The upward current of water sorts the particles of ore according to their density, the lighter particles rising to the surface and flowing out with the water, while the denser particles resting on the bottom are gradually moved outward to the periphery of the pan and the outlets, by the scrapers, the rotation of the mass, the conoidal or sloping form of the false bottom, and by the oblique action of the inner circle of jets of water. The patent covers a number of details of construction which makes the concentrator more perfect in its action.

Leadville's Ore Shoots.

The Leadville *Herald* makes an interesting comparison between the deposits of that section and the ore as found elsewhere by remarking that in the Leadville district the mineral is generally found in shoots, so called, which possess great regularity and length, and are as a rule easily discovered, when once the plane of contact between the limestone and porphyry is opened. That these ore shoots possess an interminable length is not claimed, but they have been followed and found productive for over 2,000 feet. Their maximum length has never been ascertained, but among the various shoots disclosed, some have been found with a limit to the westward, while others have feathered out and disappeared with depth, or to the eastward. Owing to the numerous faults coursing this section from north to south, displacing the mineral zone, and the imperfect exploration of the contact plane, we are still in the dark regarding many interesting features concerning our ore shoots.

The ore shoots of Leadville, almost without exception, have an approximate north east course, with a dip varying from 10 to 20 degrees from the horizon. The hanging wall or floor of the ore bodies is limestone and concave, like a trough. Could the overlying material and ore be removed the limestone would present somewhat the appearance of a piece of corrugated iron roofing. The overlying porphyry, as a rule, presents nearly a perfect plane. The width of the Leadville ore shoots averages from 25 to 400 feet, and the thickness from 3 to 40 and even 80 feet.

The most pronounced and ideal ore shoot opened in this district is the large one in the Iron mine, and another on Carbonate Hill, passing through the Catalpa, Stars and Maid of Erin mines.

The main Iron mine ore shoot was about 300 feet wide at the surface, and showed a thickness of 5 to 25 feet. It continued with little variation for over 1,000 feet, but after that began to diminish, and at 1,500 to 1,800 feet from the outcrop, gradually decreased in size, and finally lost itself in small seams and stringers. As the outcrop of this shoot is the result of a fault or displacement, it is hy no means the western extremity of this wonderful ore shoot, and how much of it lies huried under the western slope of Iron Hill no one can say.

The great ore shoot on Carhonate Hill, contrary to the Iron Hill ore shoot, is weak at the western outcrop. Where lifted to the surface in the Yankee Doodle and Crescent claims, it is quite thin and irregular, but improves in strength and regularity with depth. Below 800 feet from the outcrop it opens out until it attains a thickness in places of 60 or 70 feet, as shown in the Evening Star mine, and a width of several hundred feet. It continues with almost unabated strength from this point on through the Maid of Erin, Clontarf, Brookland and Wolftone mines, a total distance of over 2,000 feet, as far as yet developed. It has so far yielded over $6,000,000 worth of silver and lead, resulting in a clear profit of over $2,500,000, aud is prohably good for half as much more.

While the above are fair representatives of the great majority of ore shoots in this district, there is another class which is fairly represented by what is termed the "gold ore shoot" in the Silver Cord mine, and less than 500 yards from the great Iron mine ore shoot. The "gold ore shoot" at the outcrop is in the plane of contact, but as depth is gained it sinks rapidly into the limestone floor, and at 700 feet from the surface is 125 feet helow the plane of contact, existing as a continuous chimney of ore of irregular circumference. Its value, so far as we know, has not heen impaired hy depth, and further opening will unquestionahly prove it to he identical with one of the large ore shoots opened in the Louisville or Ruby mines, further to the eastward.

From all that is knowu of the Leadville ore deposits, it is reasonahle to conclude that but for the interruptions occasioned by displacements of the ore plane, continuous ore shoots would bc disclosed, having a length of 3,000 to 5,000 feet.

The ore shoots ahove described are the principal ones so far discovered. There are probably 50 to 100 others in this district. For instance, the large Carbonate Hill ore shoot is flanked hy three paralleled shoots to the north and prohahly half a dozen to the south, all presenting the same general characteristic, but inferior in strength. The same is true with the Iron Hill belt. In this section, between the Crown Point and Iron mines, which are nearly a mile apart, a score or more distinct shoots of pay ore have heen opened, several of which are nearly as strong as the great Irou mine shoot.

THE PRECIOUS METALS.—Burchard, Director of the Mint, in his special annual report on the production of gold and silver in the United States for the calendar year 1884, which has heen ordered printed, estimates the production of the country to have heen as follows: Gold, $30,800,000; silver computed at the silver dollar coining rate, $48,800,000, total $79,600,000. This shows an increase over the yield of the previous year of ahout $800,000 in gold, and $2,400,000 in silver. The total deposits of gold at the mints during the year amounted to $50,518,179, of which $30,807,200 was reported as domestic. The exports of gold hullion, exclusive of United States bars, amounted to only $115,000.

To the amount deposited at the mints and the small amount exported might properly he added the $600,000 worth of gold contained in the silver hullion exported, and also possihly $700,000 undeposited gold in the form of nuggets, grains, etc., used in ornamentation and $200,000 in hars in private refineries used for similar purposes, which make in all an addition of about $1,500,000, hut of the gold received from British Columbia and northern States of Mexico, amounting to $1,100,000, only $400,000 was deposited at the San Francisco Mint as foreign, and the statements furnished hy refiners show that it was refined hy them and included in the refined hullion deposits at that mint under the head of domestic.

Mine Managers.

The Leadville *Herald* speaks to the point on the subject of mine managers when it gives the experience in that camp: Many a hright and able miner has participated in the discovery and development of Leadville's great mines, and scores of conceited and ignorant tenderfeet have injured this district and hrought our system of mining into disrepute. In spite of all the commendable work done here it is douhtful if the district would have withstood the onslaught of egotistical, pumpkin-rolling mine-managers, but for the fact that the ore is all found near the surface, and easily extracted. In the early days of Leadville almost every trade and profession was represented in the list of mine managers. We recall distinctly among the men in charge of prominent mines, doctors, lawyers, hankers, ranchmen, printers, merchants, hrokers, railroad engineers and mining engineers. We place mining engineers at the end of the list, not hecause they were least in numher, but that they were in the minority, when they should have constituted 90 per cent of the persons in charge of mines. With such a galaxy of unique talent is there any wonder that this district is covered with abandoned shaft-houses, and that the hills are honeycombed with shafts and tunnels sunk in ineligihle places.

It was a mining engineer that gave the Chrysolite mine the Roherts shaft, from which millions were extracted, and it was a printer that directed the sinking of the Daily shaft on the Little Chief claim and erected large buildings and machinery after the mine was practically exhausted.

The inflated ideas of a little assayer are responsihle for nearly a dozen ungainly barn-like shaft-houses on two claims on Carhonate Hill, and the want of sufficient knowledge to erect suitahle buildings accounts for the miserahle sheds on other claims.

Familiarity with the work in hand gave the Iron mine working inclines in the beginning, through which it worked out its entire territory and half of its neighhors, while ignorance is responsihle for six or eight shafts sunk on another property, and yet there is no working avenue through which ore can be hoisted economically.

But for the introduction into this camp of a culinary artist as a miner Iron Hill would not now have a shaft sunk through quartzite into the granite, and to the zeal of a shoemaker is to he credited the driving of tunnel in barren rock for hundreds of feet into Ball mountain.

At present a great improvement is noticeahle in every direction, and those mines that are not under the control of mining engineers are in charge of persons who have had from three to seven years' experience at mining, and consequently are familiar with the geology of this district and the first rudiments of mining. As a consequence the exploration work of our mines, as well as the surface improvements made in the last few years, are far more practical and valuahle than those made years ago. Our present mining men have profi ed hy the experience of their predecessors. Expensive experimental work has ceased, and approved methods and systems of working have taken the place of the wild hap-hazard operations of the early tender-foot.

Nevada Mines.

The Candelaria *True Fissure*, Nevada, in speaking of hetter times in the claims south of that place says: A supplement to the flattering returns from the mines north of here, and in this county, is added hy those situated at and near Silver Peak, ahout forty miles south. The little 5 stamp mill near there has been running nearly two months on gold ore from the Drinkwater mine, and two shipments of hullion have beeu made. The first was valued at from $1,600 to $1,800, the second reached nearly $2,500. John Chiatovich leased the mine late last year and associated Alex. Palm with him in the enterprise. The property helongs to the New York and Silver Peak Company, hut to the two parties mentioned belongs the credit of the success now heing made. The mill bas beeu thoroughly overhauled and many new parts added in the way of repairs. It is now under the supervision of Fred Vollmer who understands working the ore, as is seen by the fact that the last hatch of hullion was produced from 90 tons of ore. Sounds of activity are also heard from the mines in the vicinity of Alida Valley, and a renewal of working the State Line mines may be anticipated.

Ore Producers at Eureka.

When one considers the few men employed in the mines of the district, says the Eureka *Sentinel*, and consequently the small amount of prospecting and other work heing done, he cannot hut appreciate the shipments of ore now heing made to the Eureka Con. and Richmond Reduction Works and also the merit and actual worth and value of the mining properties immediately around us.

During the past few days the Friday and Hamburg mines, adjoining properties on Prospect mountain, have made shipments ot good ore to the Eureka Con. Works. The former sent in 14 tons and the latter 28. The Hamhurg also sent to the Richmond Works 13 tons. The Lord Byron, which is also located in the same section, sent to the Richmond Works 44 tons. None but tributers, we believe, are working in the property, and all are said to he doing hetter than if they were working for day's wages. The Ione sent in 3½ tons of ore to the Eureka Con. Works, and the Battery and Bay State, the two latter properties located in Newark, made shipments of 10 and 11¼ tons respectively. Some tributers in the Bay State also sent to the Richmond furnaces 11½ tons. Several Secret Canyon properties have also made shipments of ore, among them the Uncle Sam, which sent in 3 tons and the Irish Imhassinder 5 tons. The latter shipment of ore is of a good quality, and will pay handsomely those to whom it helongs. The Rescue mine, a Silverado property, shipped 10 tons, some of which is very rich. The Macon mine on Adams Hill is again producing high-grade ore, and during the week it sent to the Richmond Works 15 tons. The Williamshurg, also located there, sent in 12½ tons. Thus it will he seen that, notwithstanding our camp is undergoing an unprecedented depression, mining in our midst is hy no means suspended. The district never had more producing properties than it has today, and when one considers the very few men employed either on wages or the tribute system, he cannot but feel hopeful of the future. Eureka district has tbe wealth, and all it needs to hring about a prosperous state of affairs again is a few good practical capitalists who will develop and cause to produce some of our many idle properties of merit and worth.

The Larger Mines.

The Eureka Consolidated mine is reported at the office of the company here to he looking well. The various pitches producing ore are holding out, in many cases, much hetter than it was expected they would, and were it now possible to reduce the ore at their works as it is produced at the mine the yield of hullion would undouhtedly astonish many. As it is, much of the ore will necessarily have to remain at the mine until the new furnace, which is fast approaching completion, disposes of some of the 2,500 tons now mixed and stored away for reduction. The Richmond mine continues idle. Manager Probert is in town, and while we have not learned definitely of his intentions as to the resuming of work in the company's properties, yet it is the general belief, and it is so reported, that a number of men will he put to work in the mine shortly on day's wages, and that their furnaces will again he fired up a week from to-morrow.

New Enterprise in Nevada.

Notwithstanding the doleful predictions of the croakers, men of capital and understanding appreciate the resources of Nevada generally and of Esmeralda county in particular, as is shown hy the fact that a syndicate has heen formed in England for the purpose of doing extensive work at Candelaria. A company has heen incorporated under the name of the "Candelaria Water-works and Milling Company, limited," and bas purchased the property of the White Mountain Water Company, also the mill-site and other property, exclusive of the mine heretofore owned by the Princess Mill and Mining Company. This company intends to confine itself strictly to milling custom ores and will purchase no mining property or engage in any mining operations on its own account.

Another English company has heen organized, and has purchased the Princess Mine, upon which a numher of miners, to he increased about May 1st, have already heen set at work. Colonel W. J. Sutherland, F. R. Behr and R. E. Doren, who were mainly instrumental in engaging the interest of the English capitalists in the above-named property, made a friendly call at the *Bulletin* office last Friday, and during the conversation the reporter gathered the foregoing, and also that work on the mill will he begun on or hefore May 1st, and that everything will be done on an ample scale and in the most complete manner. As it is contemplated entirely for custom rock, it will he so arranged that ores from different mines can be worked separately, yet at the same time. Operations will not necessarily he confined to ores in the immediate vicinity of Candelaria, as the company is prepared to put up any class of works and at auy place in the county, where sufficient ore can be shown.—*Walker Lake Bulletin.*

POTATO hlight is doing great damage in the neighhorhood of Halfmoon hay.

Dangerous Lubricants and Mysterious Mill Fires.

A correspondent of the *Railway Age* furnishes some important suggestions under this head from which we condense as follows:

Much has heen said and written ahout explosions in flour mills and spontaneous fires in saw-mills and factories, hut little has heen thought of a suhject which in more than nine cases out of ten has heen the real cause of these otherwise unaccountahle occurrences.

Visiting mills and manufacturing estahlishments, the attention is at once attracted to the clean and orderly appearance of some and the unclean and untidy condition of others; the comparatively even running of the former and the frequent stoppages, accidents, loss of time and danger of fires at the latter.

Close investigation will show that the main cause of this is the result of using poor and highly inflammahle lubricants.

When we consider that lubricating means the interposing of substances hetween the parts in motion, to ahsorh the frictional heat and transfer it into space hy radiation, thereby avoiding ahrasion and heating of the parts, we must see that only such lubricants will be able to accomplish the desired results which are entirely free from inert matter (grit), possess sufficient viscosity to secure adhesion to the metal, and be of such fire-test as to secure radiation proportionate with the heat-absorbing quality of the lubricant.

The injuries resulting from the use of poor lubricants will not always he perceptible at once, hut they are produced gradually and persistently. The hearings of the machinery are tell-tales of the quality of the lubricants used.

Most of the cheap lubricators are made from the residuum of petroleum stills which has heen steamed and settled, thereby separating some of its gritty components, hut much of the latter, mostly in the form of charred products, remains. These residuums are skimmed out to consistency for lubricating purposes and mixed with the cheapest kinds of natural oils with all their higher and inflammable products and frequently even henzine is used. Frequently these oils are mixed in so coarse a manner that when at rest the heavy residuum will separate in the packages underneath the lighter fluid oil and the danger of using such oils is apparent.

In cold weather and when first poured on to hearings some of these oils have an apparently good body, hut in warm weather and in warm places they soon thin out, and in flour mills where it is distrihuted in close rooms over hundreds of hearings it spreads diminutively over adjoining wood-work and floors, it evaporates rapidly and its inflammable vapors mingling with the close atmosphere highly saturated with floating flour dust, form explosive combinations which a single spark, produced hy the accidental getting in the mill of even the smallest piece of iron, will explode. In saw-mills also, where pillow-hlocks, the surrounding wood-work, the flour and saw dust are saturated with such oils, and where on hot days the rising vapors can he seen, a flying spark from the rapidly revolving saws is all that is needed to set the whole place instantly on fire.

THE MINES OF BERNICE AND COTTONWOOD.—E. C. Asher, of Lovelock, writes that he has just returned from a trip to the Bernice silver mine and the Cottonwood nickel mines. He tells the *Silver State* that while at Bernice Superintendent Williams showed him around through his mine, and, so far as he is capahle of judging, it is in excellent order. In the new stope the ore, without sorting, mills on an average $100 per ton, and there is enough of it in sight to run the mill six months. A winze is being sunk from the tunnel, in which the ore is of the same character as in the stope." Work has been commenced on a new tunnel, 160 feet below the present working tunnel, to tap the ledge. This tunnel will be about 600 feet long, and it will open up about $250,000 worth of ore.

At present there are some forty men at work in the mine, some of whom are extracting ore, and others are prospecting ahead. The mill is running steadily and works about eight tons a day with five stamps. Another shipment of about $16,000 in bullion will be made this month.

At Cottonwood Canyon the nickel mines are looking splendidly. There are two mines heing worked. One is owned by the Nevada Nickel Company and the other hy George Lovelock, and hoth are producing rich ores.—*Nevada State Journal.*

THE GALENA MINES.—The prospect for a lively little camp at Galena this summer is good. There are some five or six mines working that are taking out ore on an average of three tons daily to the mine, says the *Central Nevadan*, which assays from $100 to $300 to the ton. The machinery for the new mill under course of construction hy B. F. Wilson arrived this week, and will he speedily put in place, and when completed the mine owners will he ahle to get their ore reduced at home, which will he a great convenience, as well as a saving of money. Mr. Wilson bas stayed with the camp for many years, striving to develop the rich mines that he knew existed there, and he is now reaping the reward for his persevering labors, for it is an assured fact that there are mines in Galena that will pay to work.

ENGINEERING NOTES.

Ancient and Modern Engineers.

Engineers of to-day, says a contemporary, are apt to boast thnt no work of the ancients can compare with their railways. It is not quite certain that this honst is strictly correct. The roads and bridges snd aqueducts of the Romans will, hy many, be considered as greater works than these railways. What moderu cngincer or architect, or both combined, has brought the branch of a river from a rocky gorge in the hills, 40 miles off, where the water is generally clear and never fails to supply nny of our moderu cities, as the architect-engineers did to supply Rome? This water was conveyed in a stone pipe, 5 ft. high and 2 ft. wide, by a gradunl, gentle descent, sometimes on the top of a lofty bank hy the side of the river (Anio, from which the water was taken) when its course was sufficiently directed from east to west; but at intervals the line of tho river had to wind considerably to the north or south around the base of a hill; in those cases the engineers pierced their pipe through the foot of the hill sometimes for two or three miles, until it met the bed of the river ngnin; then, when they had arrived at the foot of the hills, on the level ground called the Campus Romans, in which Rome stands and through which the Tiber winds its course, they carried their stone pipe, called a specus (because it was at first a subterranean), upon a magnificent arcade five miles long, varying in hight according to the level of the ground, gradually emerging from the hill on a level at first, snd then arising sometimes gradnally, sometimes suddenly to a hight of 40 ft. or 50 ft., where they had to cross the small streams that run across the country. And this arcade was either built of stone or faced with stone almost throughout.

The specus of Claudius is carried on an arcade of cut stone; that of Nero, which is on the top of that of Claudius, is faced with the beautiful brick-work of his time, the finest brick-work that has ever been made. The celebrated aqueduct hridge called the Pont du Gard, in the south of France, is a Roman work of the third or fourth century, with a carriage road hy the side of it, as was usual with aqueduct bridges. When our engineer-architects have supplied our city with water as abundantly as Rome was supplied in the second or third centuries, and can show as fine brick-work as that of Nero, they may pretend to rival the engineer-architects of ancient Rome, hnt not hefore.

BELGIAN SYSTEM OF CANAL TOWAGE.—The system of towing canal hoats known as the Belgian system may he briefly dcscribed as follows: A stout wire rope or cahle is lsid down in the hed of the cnnal. Each hoat is provided with a device called a "clip pullcy" or drum, consisting of a lnrge pulley having its periphery provided with a series of closely-set moveahle jaws. These jaws form together a practically continuous groove, into which the wire rope will fit suugly, and they are pivoted in such a manner that any pressure hrought upon the bottom of the groove will cause the upper portiou of the jaws to close tightly nn the object making the pressure, and the greater the pressure the tighter will the pulley grip. Each hoat, as ahove stated, is provided with one of these automatic gripping pulleys, which is situated at the how. It is set in motion at a regulated speed of rotation, hy a stesm-engine, with which the hoat must also he provided. When it is desired to propel the hcat the cable is fished up from the hed of the canal, placed in the groove of the clip drum and the engine started. As the drum rotates the cable is pulled up at the bow and paid out over the stern, falling again into the bcd of the canal behind the heat. The latter is thus pulled alcng on the cahle. It is apparent that one hoat furnished with an engine and a clip drum may have in tow several loaded hoats of the ordinary kind. The system is exceedingly simple, practical and economical. It is extensively used in Belgium and other European countries, snd is generally beld hy enginccrs to he the best solution of the problem of steam towage on canals that has thus far been proposed. The great difficulty with all other systems employing independent means of steam propulsion, is to avoid the dangerous washing of the hanks.

THE VANNE AQUEDUCT, FRANCE.—The Vanne aquednct, France, which is seme 37 miles long, is said to he the most important and costly work that has ever been constructed of artificial stone. This aqueduct, whicb supplies the city of Paris with water, traversing the forests of Fontainbleau its entire length, comprises 2½ to 3 miles of arches, some of them as mucb as 50 feet in hight, 11 miles of tunnels, and 8 or 10 bridges of from 75 to 125 feet span for the hridging of rivers, canals and highways.

ALVORD MILL.—The addition of a Huntington centrifugal mill to the Huntington 2-stamp mill already in place at Camp Cady, has been completed and the entire mill was set in operation the other day, and is now running smootbly and satisfactorily. The mill is now equivalent to a 10-stamp in capacity and can crush 30 to 40 tons of ore per day. There is an abundance of water and fuel for the mill. The work in tbe Alvord gold mine, seven miles from the mill, is progressing, and the ore is being hauled to the mill daily.—*Calico Print.*

USEFUL INFORMATION.

Old Telegraph Wire.

What Becomes of the Miles of It Worn out Every Year.

"We exchange at the rate of an eighth of a cent per pound about 100 tons of old and rejected telegraph wire overy year," said the superintendent of the construction department of the Western Union yesterdsy. "We huy nothing but the best Ex. B. B. galvanized telegraph wire No. 8, which costs us from seven to eight cents per pound, sixteen feet to the pound. From fivs to seven years we calculate as the life of a wire, but oftentimes have been compelled to replace them in less time, owing to being poorly put up hy the climbers, and where the wire joins the cross-har rust will ensue. In a climate like ours the wires will last much longer than where the air is continually moist, as is the case in the lake region or along the sea-coast. Wires strung along the coast sre often found encrusted with n salt deposit, which in course of a few years will cause much trouble to the operators, and if a storm occurs the weight upon the wires will cause hreakage to ensue, which is often charged to the severity of snowstorms.

"A wire when once cut, as is often done hy the fire department to hasten the erection of their ladders, is easily joined togetber, but we always consider such a wire defective and to these first do we look when trouhle is reported."

Superintendent Kennedy of the Baltimore and Ohio service said they usually exchanged ahout 40 tons of wire every year. "The owners of wire-mills will not buy it, hut will exchange with us, allowing hut an eighth of a cent per pound. I don't know what use they make of it."

"The first wire erected for telephone purposes," said Manager McAleer, of the Bell Telephone Company, "was No. 16, or the thickness of the thirty-second part of an inch, and it wore well for ahout a year, but heing easily rusted was replaced with the ordinary teleg aph wire. You will, no douht, find the former lying upon the roofs of many houses throughout the city, our workmen not taking the trouhle to remove it. As yet we have not sold any old stock, but if we find a purchaser will let him have it cheap."—*Phila. Times.*

DO SAW TEETH SAW?—It is a very interesting study to observe the effects of high cutting speed in saws and moulding machines, hut it must be very mysterious to the observers who advocate that it is not the teeth that saw, but the air that is confined within the spaces when driven at a great velocity. It makes a very pleasant theory and gives the disbeliever a chance to disprove it. The circular saw when in motion gathers a quantity of air between each tooth and completely protects them as if plated with steel, and will glide through the hardest oak cutting a clesn skerf, the particles of air serving as a cutting edge, hut it has not been explained why the saw needs filing. It would seem, according to this theory, that all that would be needed would be to let the saw rest a moment and give it a chance to ventilate itself and get a new supply of fresh air within the teeth; or perhaps this gaseous fluid works hoth ways, since action and reaction are equal, and removes the edge on the saw tooth, leaving the impression that it is the silicious impurities in the timher that wears away the teeth.

POWDERED ASBESTOS can be used advantageously for making an enamel or coating for walls, pipes, etc. The powder is mixed with soluhle salts, such as silica'e of potash, and mineral or other colors which combine with silicic acid, so as to form a product which resists the action of oxygen, heat, cold or damp. The coating furnishes a refractory glaze which protects the material it is applied to, whether wood, gas or water pipes, and stone or hrick huildings. When applied to masonry or wood the surface of these is first washed with soap and water. In preparing the enamel the refuse ashestos only need he employed. It is also proposed to apply the coating to hoilers in order to protect the plates against a too intense fire.

TOUGHENING TIMBER is a new process hy which it is claimed that whitewood can be made so tough as to require a cold chisel to split it. The result is reached hy steaming the timher and submitting it to end pressure, technically "upsetting it," thus compressing the cells and fibers into one compact mass. It is the opinion of those who have experimented with the process that wood can be compressed 75 per cent., and that some timher which is now considered unfit for use in such work as carriage huilding, could he made valuahle by this means; and more especially since the rapid consumption of our hest ash and hickory will sooner or later render some suhstitute necessary. —*Wood Worker.*

PASTE FOR ENGRAVINGS.—To make a paste that will not draw engravings when pasted down on paper, use a thin paste. A mixture of gum tragacanth and gum arahic forms with water a thinner mucilage than either of these two gums alone. Rice flour is said to make an excellent paste for fine paper work. A solution of 2½ ounces gum arabic in 2 quarts of warm water is thickened to a paste with wheat flour; to this is added a solution of alum and sugar of lead 1½ ounces each in water the mixture is heated and stirred until about to boil, and then cooled. It may he thinned with a gum solution.

TO BLEACH FLANNEL.—Flanuel whicb has become yellow with use may be bleached hy putting it for some days in a solution of hard sosp, to which strong ammonia has been added. The right proportions sre one pound and a half of hard curd sosp, 50 pounds of soft water and two-thirds of a pound of strong ammonia solution. The same ohject may he attained in a shorter time by placing the flannel for a quarter of an hour in a weak solution of hisulphate of sodium, to which a little hydrochloric acid has been added.

CLEANING POWDER FOR SHOW WINDOWS.—A good cleaning powder which leaves no dirt in the joints, etc., is prepnred by moistening calcined magnesia with pure henzine, so that a mass is formed sufficiently moist to let a drop appear when pressed. The mixture is to he preserved in glass hottles with ground stoppers, in order to retain the easily volatile henzine. A little of the mixture, when to hs used, is placed on a wad of cotton and applied to the glass plate. It may also hs used for cleaning mirrors.

PLUMBAGO IN A NEW ROLE.—It is said that a Frenchman has devised a process of giving to felt a slight coating of plumhago or metal, hy which the appearance of burnished steel, copper, bronze or silver may he imitated. The product is likely to prove very useful when applied to stage properties, as hesides heing inexpensive it does not materially increase the weight of articles treated with it.

URANIUM PHOTOGRAPHY is becoming popular in France. The salts of the metal are gold, green and grcenish hrown, and in thin layers produce very delicate tints. For photographing forests and landscapes they are superior, giving pictures that are nearly perfect reproductions of nature.

GOOD HEALTH.

"I've Been Thinking" Series—No. 5.

[Written for the PRESS by JEWELL.]

How to Become Beautiful.

Natural heauty, whether in plants, animals, or in men and women, is the grand external sign of perfectness of organization and integrity of function. In the proportion that we approach physical perfection do we hecome physically beautiful? As Dr. Pritchard truly says: "The idea of heauty, heing synonymous with health and a perfect organization." Deformity of limhs always shows a want of perfection in the locomotive system, or muscular development; a had complexion indicates weakness or disease of the nutritive system; a dyspeptic stomach or diseased liver records its condition on face and form, in angular lines, sallow complexion and other well-known signs, all detrimental to physical beauty. Health, then, is indispensible to and one sign of heautv. And shall we not, by studying its laws and obeying them, he laying the very foundation of physical perfection? Health is dependent upon certain conditions—which we may or may not be ahle to control; hut all should strive to attain such knowledge of their own deficiencies and needs as to he able to maiutain perfect, harmonious vital action.

The essential needs of health demand a sound physical organization, a vigorous snd well-balanced mind, a right use aud constant supply of all elements needed for the hody—such as pure air, sunlight, food and drink, sufficient physical exercise, rest and sleep, cleanliness and proper temperature, with harmonious social relations and the equal distrihution of clothing over the body for comfort and freedom of motion. Also an avoidance of whatever conditions aud habits are harmful.

Perfect physical heauty demands, also, ease and gracefulness of motion. These may be natural, or cultivated, hy giving free play to every muscle of trunk and limh.

Tight dressing is particularly ohjectionable, whether of the waist, limhs or feet, not only hy destroying the harmony of proportions, hut hy unhalancing the circulation and retarding the free play of muscular action. The Venus de Medici is considered the most perfect model form of female heauty, aud has heen the admiration of the world for ages. Alexander Walker, after minutely describing this celebrated statue, says: "All these admirable characteristics of the female form, the mere existence of which in woman must, one is tempted to imagine, be even to herself a source of ineffable pleasure, these constitute a heing worthy, as the personification of heauty, of occupying the temples of Greece; present a finer ohject, alas! than Nature, even, seems capahle of producing, and offer to all nations and ages, a theme of admiration and delight." Every home should he adorned with a copy of this charming statue, as well as that of the Greek slave. The study of such outlines of beauty of form would tend to correct the errors and fashion foihles we are so surrounded with. These forms are such as unperverted nature and the highest art alike require. To compress the waist, pushing in the ribs and displacing the vital nrgans, is ss destructive to beauty as to health.

It was *possible* of the All-Wise Creator to make the human form the shape of an hour-glass, with the ribs running up and down, as fashion would have them and modern corsets make them, hut *He did not*—nnd may we not trust thnt He knew hest, and doeth all things well?

Something more than mere external beauty is required to fully satisfy the heholder. The eye must beam with intelligence, truth aud purity—yea, and love, too, which has the power of illuminating even the plainest face aud form with heauty.

"There is a continual relation," Riofrey says, "between the hody and the mind; slavery, vice and ignorance brutalize the features; virtue, independence and knowledge ennohle them. How hideous is the countenance of an ignorant, vicious man! How admirable is that of an honest man, enlightened hy knowledge and science!"

Those who desire to acquire and retain a high order of beauty, therefore, must keep the intellectual powers in healthy activity. I recall to mind a friend of long ago, whose face was positively ugly; only two redeeming points of beauty had she—her hair, which was glossy and ahundant, and the shape of her head—which was elegant and classic. She was more than ordinarily intelligent, with good conversational powers. Indeed, she was a charming compsnion, and when under the spell of her conversation I have actually *felt* the beauty I knew was not there—except the *spirit* of it that illuminated the face.

Looking back, at this age, I verily believe that had she not lacked the *vital* essence of heauty itself—that of the spirit—had she been true, pure and healthy, as well as intellectual—she might have overcome the deformities of face and form and been as really heautiful as she was charming.

It is hardly possihle to speak or think of a person as homely who is unselfish, wise, pure and good. The inner, spiritual beauty gleams through from hehind the features, and transfigures them with a divine expression. Honesty, purity and goodness have their true facial expression, and like loving, kindly actions, win our love and admiration in return. It therefore is needful for us to cultivate moral goodness, serenity of temper, and obedience to the laws governing our spiritual heing, if we desire physical heauty of the highest type. I extract from Jacques' "Physical Perfection" this recipe: "To acquire a beautiful form, take ahundant exercise in the open air—free, attractive, joyous exercise, such as young girls when not restrained hy false or artificial proprieties are wont to take. If you are in the country or can get there, ramble over the hills, and through the woodlands; hotanize, geologize, seek rare flowers and plants; hunt birds' nests and chase butterflies. Be a romp, even though you are no longer a little girl. If you are a wife and mother, so much the hetter, romp with your children. Attend also to your bodily positions, in standing, sitting, lying and walking. Live while indoors in well ventilated rooms; take sufficient wholesome and nourishing food at regular hours, keep the mind active and cheerful—in short, obey all the laws of health."

In conclusion I add, to promote heauty, cultivate health of body, mind and soul. The greatest good embodies the greatest beauty, and is attainable only and always through correct living and nohility of thought and action.

Deer Ridge Farm.

NEVER STAND AT THE FOOT OF A SICK BED and survey the patient. All figures loom large to fevered eyes, aud by the side of the hed are only partially seen, and do not annoy with the sense of too much presence. Do not open the door very slowly, for then the attention is strained, speculating as to who the next comer can possibly he after all this preparation and with such cautious approach. Low but clear tones, quiet hut sure movements, and rapid rather than slow, are a great relief to any patient who is hlessed with a practical nurse. Whispering is torture. Silence is best until you can discuss matters in another room; hut if you speak, speak out, and make no mysteries ahout anything. In severe illness the nurse must watch her patient steadily, but not seem to be looking. In convalescence it frequently sooths the invalid to have the nurse seated at the window apparently looking out. This frees the faculties from the tension that the sense of heing watched usually gives.—*Hall's Journal of Health.*

COFFEE ADULTERATIONS.—Only 13 out of 91 samples of coffee analyzed during one month in Paris were pronounced pure. One specimen package is reported to have contained the following ingredients: Red earth, flour, coffee grounds, caramel, talc, plumhago, vermicelli, semolino powder, bean-dust, carrots, hread crusts, acorns, saw-dust, red ochre, hrick-dust, ashes, mahogany shavings, vegetables, earth and sand.

VACCINATION.—Singular to say, there are many well-informed people who inveigh against vaccination as a preventive of small-pox. The facts of history are convincingly against them, however. The latest vindication of vaccination comes from Durham, England. There were 103 cases treated at the hospital, of which ten were fatal. Of those who died not one had heen vaccinated. Of the other 93 not one had heen revaccinated.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

THE BOSS NUGGET.—Amador *Ledger*, May 2: One of the finest nuggets ever surrendered by the placers of Amador county was taken from the gravel claim of James Hall, located on Grizzly Hill, about 2½ miles from Volcano, on Friday last. It weighed 30¾ ounces and 12 grains. It is a solid mass of gold, not a particle of quartz is mixed with it. Such gold sells at $18 per ounce, so that the value of this nugget is $540. Three other chunks were also picked up on this claim lately, having an aggregate value of $300. In two weeks the owner of this splendid property has taken out 80 ounces of gold, worth $1,500. Such returns rival the palmiest days of this mining camp. Indeed, Volcano is decidedly on the improve as a gold producer.

VALPARAISO.—Important developments have been made in this quartz claim this week. The mine adjoins the Mammoth on the north. Some of the richest deposits of gold-bearing metal met with in the Mammoth have been taken not far from the Valparaiso boundery. This fact encouraged the owners of the latter claim to run a prospect tunnel north toward the Mammoth, in the hope of striking the same golden seam. This tunnel was started from the gulch, and after pursuing a straight course for 25 or 30 feet, a curve was made so as to keep in soft rock if possible. Beyond this point of curvature the tunnel has been run a considerable distance without material results. A few days ago E. Ginnochio, one of the owners, resolved to commence a cross-cut east at the point of deviation from the straight course, only 25 feet from the mouth. After blasting 2 or 3 feet, a seam of greenstone quartz was encountered, carrying the same kind of black metal for which the Mammoth is so famous. A large block of the ore was brought to Jackson Wednesday morning, one of the first pieces blown out. A chunk of the rich metal is readily detected by those acquainted with the ores of that district. This strike is over 800 feet north of the place where the Mammoth mine is being worked, and the conclusion is irresistible that the gold-bearing vein continues the whole of the intervening distance.

MISCELLANEOUS.—The Median near Amador City continues to develop strongly; the ledge is said to be 20 feet wide in places, and believed to be of paying grade. The shipment of gold sent by the St. Julian lately realized over $2,700 by Mint returns. Since this shipment the mine has surrendered over $800 more. Last Monday the Keystone mill was stopped to enable the reservoir to be cleaned out. Sediment accumulates to such an extent as to necessitate a washing out about every six months. In places the mud is from 10 to 15 feet deep. The cleaning out process consists in running a full head through the reservoir. In a few hours the entire lake of mud is washed into the creek.

SUTTER CREEK.—Cor. Amador *Ledger*, May 2: Rumors are afloat of new developments in the McIntyre mine; the rock is reported to be improving in quality. It is also reported that the Mahoney Company are negotiating for the sale of the property to a wealthy English company.

FRENCH CAMP.—The mining claims of the little camp on the Cosumnes river, 3 miles above Grizzly Station, are all running full blast, with abundance of water. Some of them are said to be yielding well, others are barely paying expenses. H. Wilson is prospecting on his iron mine. There is a large body of ore in sight, some of which has the appearance of pure iron. When the ore is heated in a crucible the metal runs out in a stream. By the side of this ore body, there is a fine stratum of mineral so hard that a common grindstone will make scarcely any impression on it. It is capable of receiving a high polish, and will cut glass, it is said, almost as readily as a diamond. There might be something of great commercial value contained in this rock. Mr. Wilson says his mine is worth $100,000 when properly prospected. It is partly in Amador and partly in El Dorado county.

El Dorado.

COUSIN JACK.—*Mountain Democrat*, May 2: O. F. Eaton passed through town yesterday on his way to the Bay with some fine samples of ore from the Cousin Jack mine, near Brownsville. The mine will soon be started up and thoroughly prospected.

BOULDER MINE.—The Boulder mine, in Coloma township, is looking better every day. The mill is kept constantly at work, and the rock being crushed gives every promise of a permanent ledge.

CONTRACT COMPLETED.—Owen Roberts, Thos. Moyle, John Pasco and Edwin Bill have completed their contract for sinking 50 feet further on the Old Hickory mine, and have had a settlement.

Inyo.

DARWIN.—Inyo Co. *Register*, May 2: Gorman & McKenzie are working at the old Custar mine, in which a new ore body was lately struck. The Lucky Jim is being steadily worked.

PINE TREE AND A. K. B.—Messrs. Eldred & Hedge are working these mines which they leased from Alexander, Kehoe and Barnes, with good results. These are both extensions of the White Hill mine.

COPPER QUEEN.—The Copper Queen is one of the late discoveries in Russ district, being so named from the fact the mine when first opened showed good copper ore. It has, however, on further development changed to lead ore, 75 oz. silver, 65 per ct. lead. The pay streak is 3 in. wide; traceable 500 to 600. feet

THE OLD UNION.—Reynolds & Treglown are working steadily away on this property. The shaft is down 160 feet, a drift is now being run. Some 20 tons of ore are ready for shipment. Assays run on the average 55 oz. silver, 52 per cent lead and $7 in gold.

ESPERANZA.—A new strike has been made in the mountains east of Lone Pine, on the Hunter Canyon trail. The mine is situated on the extreme summit. Elies & Lopez are the locators; an incline of 30 feet has been run. The rock bears gold.

WANTED.—Should the Russ district mines continue their present favorable showing, of which there seems to be no question, a custom furnace situated on the river somewhere in the valley will become almost a necessity. One such, if properly managed, would be worth as much to its owner as any mine.

LUTRA.—This old mine—which may not be recognized by its present name—is now being worked by Messrs. Harvey & Speer. It is situated in the foothills opposite Lone Pine, about one and a half miles distant from the railroad station. The ledge is wide, the ore assaying from 65 to 300 oz. silver, and 35 to 48 per cent lead. The tunnel is now in about 33 feet.

VICTORIA.—The Victoria, on Santa Rita Flat, east of Independence, has lately been worked by Phil. Cartier and John H. Gray, but so much water was met with in the shaft as to stop furthur progress. The ore is free gold bearing, and the average width of the pay streak is 10 inches. The shaft is down about 40 feet. Measures will be taken to drain the mine, and resume work.

WHITE HILL.—At the White Hill mine indications continue as favorable as heretofore for a continued and steady output. At the end of the tunnel, about 35 feet, the ledge is from 1 to 2½ feet wide, and late assays prove the ore to be even richer than at first. About 27 tons of ore are now on the dump.

RED HILL.—Jack Welch, Pat. Downs and Matt. McDonald have made a new and promising strike in Russ district, three-fourths of a mile south of the White Hill, and have named it the Red Hill. No assays have yet been made, but competent judges say the ore will go fully as high as that in the White Hill, The ledge shows up strong and wide on top, and croppings are plain for more than 600 feet. A shipment of ore will be made about June 1st, if lead is found in sufficient quantity before.

BEVERIDGE.—Lasky's mill at Beveridge was lately closed down. It has been running on Keynote and custom ore. Some rich gold rock has lately been taken out by the Mexican miners there. Two of Straus's steam 10-foot arastras were started on the 21st on ore from the Gavilan mine, in which a 5-foot ledge of gold-bearing rock is being worked. Another arastra will be started as soon as completed; an 18-horse-power boiler has been lately set, and other improvements made. About 20 men are employed in the mine and mills; the latter will crush six tons per day.

MINETTA.—This is the name of one of the latest discoveries in Russ district, in the vicinity of the White Hill. Messrs. Crough, Eldred and Hedge are the owners, the first named being the discoverer. The ledge, which is 12 to 18 inches wide on the surface, can be traced for nearly a mile, and at any point ore can be found. In this prospect, as in the Red Hill, what is called "black metal" is found in spots, which will assay upward of $500 per ton, but the average value of the ore is thought to be something over $100 silver, with a high percentage of lead.

RUSS.—The new developments in this district, which promise to be of such importance, are situated not over 12 miles south-east of Independence, near the summit trail to Beveridge. They are within a short distance of the Union Spring. The district itself covers the western slope of the Inyos between Lone Pine and Independence, and faces the railroad. The mines of the White Hill group possess natural advantages equal to any in the county, and we can see no reason whatever for doubting that Inyo will, ere long, export bullion steadily.

Nevada.

FRENCH CORRAL MINES.—*Foothill Tidings*, Mar. 29: French Corral in this county has had for many years a world-wide reputation as a hydraulic mining district. The Milton and other companies there made the great reputation. But French Corral has likewise some good quartz, as mill workings have shown. About 12 years ago there was a quartz mine and mill (10 stamps) at that place and the mining and milling of ore returned profits to the owners. A slide, however, occurred which damaged the mill and tunnel to such an extent that work was stopped. Then the owners disagreed, which made the stoppage continue until the present. Now, however, Charles Bradford and Alex. Dahlberg have purchased a controlling interest in this mine, called the Slide, and they are going to work the ledge. The tunnel is being cleaned out and repaired and the mill is to be fixed up and put in first-class order. The quartz will be taken out through a tunnel, and the tunnel gives at least 1,000 feet of backs. The quartz looks well, showing free gold to the naked eye. The ledge is from 6 inches to 30 inches thick, and the country rock is slate. Several working miners have purchased the old hydraulic claims heretofore belonging to Mr. Villain, and the purchasers will proceed to work the claims at once by drifting. These claims would not pay any more by hydraulicking even if there were no legal difficulties in the way. The new owners by careful and systematic work and by being their own workers think they can do well by drifting.

DERBEC.—North San Jaun *Times*, May 2: There are over 80 men on the pay-roll of the company, of which number from 20 to 25 labor on the lower level of the mine; the others work in the tunnel, at getting out timbers, in the mechanical department and at the dump. The shaft is about 400 feet in depth, and the level on which the company is drifting is about 360 feet below the surface. The gravel now hoisted through the shaft is obtained about 4,000 feet distant from the shaft, and almost due north from that standpoint. The mine is drained by a tunnel over 3,000 feet in length, the water emptying into a creek near the town of North Bloomfield. It is from this tunnel that most of the gold is taken at the present time. Wm. M. Davis is the undergound foreman of the mine. We heard fears expressed by several of the employes that the mine would be closed down in the near future, not for repairs, nor because it does not pay, but for, they say, the purpose of reducing wages from $3 to $2.50 per day. The workmen say that an effort has been made to accomplish such a reduction, but without success. They strenuously oppose any reduction of their wages. Relief Hill is a quiet camp, there are two drift mines at work in the neighborhood.

Plumas.

STRUCK GRAVEL.—Plumas *National*, May 2: Messrs. Meikle, McDonald and McDougall struck gravel in the bottom of their shaft last Monday night. Mr. Meikle informs us that it is about 4 feet thick, and looks like the genuine pay grit. This claim joins the Garland claim, and is undoubtedly just as good.

THE ALTOMA.—Greenville *Bulletin*, May 2: This mine is situated near the Cherokee, and was worked two years ago. Judge Emmons is now sole owner. The chimney worked out above paid $10 per ton. A second tunnel, which was begun for the purpose of tapping the chimney at greater depth, is now in 230 feet, and it will be pushed ahead until the chimney is reached.

GOLD STRIPE.—Work has been commenced in the Bidwell tunnel, the length of which is 900 feet. After making an upraise of 70 feet for an air shaft, the tunnel will be driven ahead 275 feet to tap the pay chimney which was in the tunnel above. The backs will then be 50 feet. This mine has been very rich, and there is but little doubt that if the stockholders would put up the proper amount of money for development, the mine could be made to yield as richly in the future as it has in the past.

Shasta.

BUCKEYE.—Shasta Co. *Democrat*, May 2: We visited several mines in the Buckeye district last Saturday. We found Dan O'Neal of the Florida hard at work re-setting his cannon-ball mill. He has several tons of rich ore on the dump which, upon being burnt, shows much free gold to the naked eye. From there we visited the Mammoth and Central, owned by Messrs. Willet, Young, Meyers & Co. Here we met a couple of mining men who were taking samples of ore from the two mines for testing with a view of purchasing the property. The Mammoth is simply immense; the vein is 22 feet wide, the pay streak is over 16 feet in width, and 69 tons of ore crushed in an arastra yielded from $23 to $45 a ton. The Central is not as large a lead, but we think it equally as good property. Both mines are splendidly situated for deep development. Returning home we passed by the Florida to the first extension south, where we found four hardy and jolly prospectors had struck a rich thing only a few days ago. They were down ten feet on a strong 5-foot vein, and were taking out rock that goes $300 to the ton. The rock is of a honey-comb nature and appears to be free milling. These four prospectors had come from Trinity county where they had spent about two months unsuccessfully, and to say that they are now happy would hardly express it. They think that they have struck it at last. However, to say the least, it is a very rich and flattering prospect. Passing by Tom Harrison's place we found him sluicing over some tailings that are paying him from three to five dollars a day. Tom, also, we think, owns some good quartz property, and is preparing to start up his arastra.

BONDED.—*Courier* May 2: Fife & Dale, the parties to whom the Silver King claim near Centerville was bonded for $10,000, have surrendered the mine after having sunk some 70 feet on the ledge. We understand that Brincard & Lowrey, owners, continue the work. A French gulch man says there is more exhilarating beverage drank in that hamlet and more gold taken out of the mines of that district than in any other locality of equal population in this or any adjoining county. The group of mines now owned by Wm. T. Coleman in French Gulch district are known to be rich and contain ore enough to yield millions. It was a lucky day for Mr. Coleman when he invested in those mines, and it was also a lucky day for French Gulch district when he directed a portion of his capital in that direction.

SULPHURETS.—Shasta Co. *Democrat*, May 2: Mr. James Sallee was at Flat last week examining the sulphuret concentrates of the Murray mine. His assays gave an average of $163 per ton in gold. The McDonald Bros. & Franck, of Deadwood, have two Frue concentrators attached to their 5-stamp mill. The percentage of the sulphurets in their rock is so great that it keeps both concentrators running to save them all. These sulphurets are of a very high grade. Work on the Last Chance mine near Flat creek, recently bonded by Capt. Wm. York, of Vallejo, is progressing rapidly under the direction of Mr. George Smith. A good road has been built between the tunnel and the mill, and the mill is being overhauled in preparation for a run. Four men are employed. Messrs. Derby and Skidmore, of San Francisco, were on Squaw creek last week examing some locations in that district. Their attention was called to the locality by Mr. W. W. Nichols, of Camp Bailey, and were his guests during their stay. On their return they took samples of ore to the city for the purpose of making working tests. M. P. Schearer has struck the richest gold quartz prospect we have seen or heard of in this part of the State. It is located on the south bank of Salt creek about 500 yards from the railroad, and about 2 miles from Redding. This strike was first made about six weeks ago by Messrs. Schearer and Rattler, while clearing away some tailings deposited in the gulch by Chinese miners, and at that time the rich quartz caused no little excitement in Redding. They have sunk a 20-foot shaft on the vein, and the quartz is richer than ever, even much of the slate lining is richly impregnated with fine gold. The vein seems to be quite well defined, is strong wo feet wide, and pitches into the mountain. In all this prospect is simply immense.

Sierra.

A GOOD RUN.—Sierra *Tribune*, May 7: Last week Hill & Son made a partial clean-up after a six weeks' run with their arastra at the Oro quartz mine, realized between $1,300 and $1,500. The exact value of the gold has not yet been ascertained. At all events, the result of the run was very satisfactory to the parties and they feel very much encouraged over it. The cost of labor and running expenses during that time was in the neighborhood of $600, thus leaving a very handsome profit.

FOREST CITY MINES.—The Bald Mountain Company, at Forest City, cleaned up 276 ounces of gold Sunday as the result of the week's work. The Bald Mountain Extension Company, at the same place, cleaned up 130 ounces of gold that day, from gravel taken out of the South Fork ground during the week. The Extension Company expect to reach the channel in their own ground the early part of July. The Bald Mountain Company, we understand, will sink a shaft soon to determine the extent of the newly discovered channel under the lava. If the result of their explorations warant it they will then run a tunnel to tap the lead, which at present is being worked through an incline.

THE ORO QUARTZ MINE.—Mountain *Messenger*, May 2: The Oro arastra belonging to Mr. Hill, was cleaned up last Saturday, after a run of 54 days, the yield being $1,365, estimating the bullion to be worth $17.30 per ounce, which is probably from 25 to 30 cents less than its true value, which will be determined when returns are received from below. The bottom of the arastra was not taken up, and contains several hundred dollars. There have also been saved some four tons of sulphurets, or blanket tailings, which are worth at least $25 per ton, and probably considerable more. The amount of quartz crushed is estimated at 256 tons. At a safe estimate the whole amount crushed averaged $6.50 per ton. The expenses of mining and reducing the rock for the run are $600. The net profit, then, does not vary much from $20 per day. While this is not big, it will put in circulation about $11,000 a year, which will materially help business to this place. Mr. Hill has another arastra, somewhat smaller than the one he has been using, about ready to run. This will be used to grind the tailings from the larger machine, and will be run on quartz when not otherwise employed. There are several ledges here as good if no better than the Oro, and when they are worked they will be a great help to everybody.

Trinity.

DEADWOOD.—Cor. Trinity *Journal*, May 2: Would it be news to the readers of the *Journal* to speak of the prosperity of the Brown Bear, the Bartled and various other noted mines? I should think not; for the bullion shipped from these mines confirms the fact. I cannot chronicle, this time, any very important discoveries, but hope to do so very soon, as prospectors are now beginning to put in an appearance. It is impossible to make strikes of any consequence without some immigration of prospectors. Walter Van Matre and Alex. Campbell have opened on a ledge about 15 inches in width which looks very promising Blakemore & Co., on Eastman gulch, have struck it good again. The strike is about 2 feet between walls and prospects immense. The Boston mine, owned by Wm. Lappan, at present bonded by W. T. St. Auburn, will soon be in operation. We live in anticipation of seeing another rich mine opened. Shattuck & Co. are expected soon to commence operations on the Klein mines, The Vermont mine will also soon be in operation. This coming summer will find our district booming with population and prosperity.

Tuolumne

LOOKING LIVELY.—Tuolumne *Independent*: May 2: Fred Sutton's San Guisseppi mine a short distance west of town is looking finely. The lode runs from 8 inches to a foot wide, and the chute is about a hundred feet long. The shaft is down 70 feet. The ore is very rich, $200 rock it is supposed, and heavily charged with sulphurets. We saw some of the rock which had been burned, and the gold was thickly distributed all over and through it. A practical quartz miner, and good judge of sulphurets present, estimated that there, alone, would yield $1,500 per ton. The mine needs no puffing; it speaks for itself, and we don't think Fred wants to dispose of it. It is one of the kind that will pay to keep and work. A party above Columbia came upon the heels of what will undoubtedly prove a fine pocket last week. Several large chunks of gold and quartz were exhibited to us. Mr. Wm. Lewis, who owns a claim on the old Sugarman mine, on Bald mountain, struck another pocket on Monday of $200. He finds them frequently, but as yet they have not been as large as the one he is looking for. Messrs. Long & Hampton were in town Wednesday. They have ten or twelve men working their Willetta mine, on Kanaka creek. The lode is some 200 feet wide, of $3 rock, with a dozen or more rich veins running through it. They are on one of these now, and expect it to "bunch up" very soon, when gold may be taken out by the pound. Mr. Long has several beautiful pieces of gold quartz, very rich, taken out a few days ago. On Saturday the Mandich brothers, on the Simonich claim, were reported to have taken out another pocket of $6,000. The figures were exaggerated—the real amount being very near $2,000. The Argentum mine looks very well. A force of men are at work on the Italian Bar mine. The Chinamen engaged in working out the lumber yard lot have a good claim.

BRIEF NOTES.—Union *Democrat*, May 2: Tom Birney and R. Ham are grinding out gold in paying quantities with an arastra four miles above Columbia. The old Baldy Clark mine at Whisky Hill is turning out handsomely under the operations of a couple of miners who are making a good thing out of it. Sinking will shortly be resumed in the Lafayphier with a power drill. Arrangements are now being made for a drill and air compressor in San Francisco. The Mandich brothers, who are working the Simonich claim under a lease, struck a fine pocket last Saturday, and report credits them with taking out several thousand dollars. John H. Neal has a force of men energetically prospecting the old Sugarman lead, which has been a famous ledge for pockets in years gone by. The prospects are excellent for a strike. Harkness & Peterson, who are working a portion of the Garrett claim, took out fifty ounces last week. They have been taking out handsome bunches at intervals all winter, but have made no blow about it. Messrs. Divoll, Bacon and White are preparing to actively prospect the Bonanza mine. The tunnel has been completed and the incline cleaned out and timbered up, and the work of sinking has been commenced. Julius Halck and his partner have lately taken out a pot of money on Saratoga Hill. They struck it big some time ago, and have been getting fat takes ever since. They are rapidly becoming bloated capitalists. Captain Colby has rigged up a water wheel to pump the water out of his mine, the Bonanza Extension, He has taken some good pockets out of it heretofore, and present prospects lead him to think he is on track of another big find. Some exceedingly rich free gold quartz is being taken from the San Guisseppi mine in Dragoon gulch. The mine is the property of J. Hall, who has lately put up pumping machinery, and has a force of men developing the property. S. H. Teeters informs us that he will put up an arastra at Sugarpine right away to crush rock from the Hoyle & Dagnar mine. He will also proceed to open up the property as fast as circumstances will permit. The property shows up finely, and gives good prospects of being quite a bonanza. There are three ledges.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, May 2: On the 2,900 level, cross-cut No. 4, after entering t

ore vein at a distance of 60 feet west from the main north lateral drift, was turned laterally with the vein and is now following it in a course or direction 45 degrees west of north. From where it was turned to this direction to the face of the drift or cross-cut the distance is 53 feet, the entire distance from the main north lateral drift thus being 115 feet. The face of this drift or cross-cut is a little less than 200 feet from the Savage north line, and is all in ore which, from average assays obtained, will probably mill $25 or $30 per ton. The width of vein at this point is unknown, and can only be determined by crosscutting, which will be done at the first eligible point, but from the lay and general characteristics of the vein in passing diagonally through it, as well as from its ascertained increase in width in cross-cuts 2 and 3, further south, its width should be comparatively great—from 60 to 100 feet, more or less. The ore in the face of the drift is very loose, requiring close and careful timbering, and making progress comparatively slow. On the 3,000 level, the lateral drift south from cross-cut No. 2 was run 15 feet, following the ore vein, and stopped in ore of comparatively high-grade. This being considered satisfactory for the present, work in that direction was discontinued, and a lateral drift north started on the opposite side of the cross-cut, which is still being continued due north, following the ore vein. It is now in, or out, 35 feet from the cross-cut, and the vein, which was 15 feet wide in the cross-cut, is evidently widening as the drift advances northward. The average assays, however, decrease somewhat in value. Cross-cut No. 3, which has been run to the wall or selvage of the vein, will soon be pushed further west to a connection with the lateral drift in the vein, giving better air circulation, and testing the width of the vein at that point.

BALTIMORE CON.—The parties working on the 225 level have their winze well started, following the rich ore streak. They got some very high assays. Last Sunday they started up the old hoisting works and hoisted out a large lot of waste which was in the way. The tributers working on the 450 level have a large amount of high-grade stored in the drifts, and plenty more in sight. They will hoist this ore out in about ten days from now. Meanwhile a roasting furnace is being built at the works. When this is completed, and not before, the ore will be raised to the surface. Over 100 tons of rich ore is stored in the drifts below, ready for hoisting and milling.

CON. CALIFORNIA AND VIRGINIA.—On the 1,750 level the main southwest drift has cut into the stopes of the old workings of the Con. Virginia ground and connected with east cross-cut No. 2. The immediate object at present is to push through to a connection with the Gould and Curry 1,700 level which will give a good circulation of air. Meanwhile what good ore is met with is being extracted. An increased quantity of ore from between the 1,550 and 1,200 levels, under the Jones lease, is being extracted and shipped to mills on the Carson river.

ALTA.—The bunches of good ore found in prospecting above the 950 level are rather too few and far between for lucrative working, and operations at that point are about abandoned. The water in the shaft has risen to above the 1,200 level, and is still rising.

OVERMAN.—The winze connection between the old Lambert tunnel and the 226 level being completed, the investigation of the low-grade are resources at that point is now in progress.

OPHIR.—The main south drift on the 1,465 level is still being used as an outlet for waste from the Con. California and Virginia, which is hoisted through the Ophir shaft.

MEXICAN.—The joint Union and Mexican drift is now 200 feet in the Mexican ground, and being driven northward at a lively rate in good working ground.

KENTUCK.—The usual amount of low-grade ore continues to be yielded from the old upper workings, supplying the Rock Point mill on the Carson river.

BEST AND BELCHER.—On the 1,000 level a drift to the north-east has been started from the main north drift at a point 100 feet south from the face.

YELLOW JACKET.—Nothing new. The old stopes of the upper levels continue looking and yielding finely, with no particular change to note.

BELCHER.—The yield of low-grade ore from the old upper levels, through the Crown Point, continues with no new features to note.

CHOLLAR.—Cross-cut No. 1 from the main south drift on the 3,000 level continues in good looking quartz and vein matter.

BULLION.—The parties prospecting the croppings are still engaged in cleaning out and repairing the old Fairview shaft.

GOULD AND CURRY.—On the 1,000 level the main south lateral drift is making good progress, running in good working ground.

SIERRA NEVADA.—The north lateral drift on the 520 level is being pushed ahead at the rate of about 50 feet a week.

CROWN POINT.—The old upper workings employ a large number of men in the extraction of low-grade ore.

Columbus District.

MOUNT DIABLO. — *True-Fissure*, May 2: The west drift from the sixth level has advanced 16 feet during the week, and shows more favorable ground with small spots of low-grade ore. The winze from the fifth level is now down 63 feet, and is showing ledge matter with a little ore. The stope above this winze is looking well, and the stope between the fourth and fifth levels shows a strong ledge of $90 ore. Some ore of good grade is being taken from between the fourth and fifth levels near winze No. 1. The intermediate, between the third and fourth level, and near winze No. 4, is giving some $100 ore from a small bunch. The west drift on the third level is giving some $150 ore from a small bunch. The intermediate, between the second and third levels and west of the shaft, is yielding a little $40 ore. The east drift on the second level is giving some ore of fair grade. The workings above the second level show no change. A bullion shipment of $12,937.08 was made on the 30th ult.

Eureka District.

NEW WORKS.—Eureka *Sentinel*, May 2: The Eureka Con.'s new reductions works are fast approaching completion. So much auxiliary work in connection with the new plant has been found necessary that the completion of the same has consequently been deterred much longer than was expected. It is confidently believed, though, that the new furnace will be fired up two weeks from Monday next. The Eureka Con. mine continues to look and produce well. The Phœnix mine on Ruby Hill shipped during the past week eight and a half tons of ore to the Eureka Con. reductions works. The Summit mine on Prospect mountain sent down to the Eureka Con. furnace the other day five and three-quarters tons of ore. The Grant mine on McCoy Hill sent to the Eureka Con. furnace eight and three-fourths tons of ore last Monday. The Dunderberg mine on Prospect mountain shipped to the Richmond reduction works the past week 11 tons of ore. Owing to a number of improvements going on in the Lord Byron mine, only 30 tons of ore was shipped to the Richmond reduction words the past week. The mine continues to look well.

ADAMS HILL.—A reporter of the *Sentinel* visited Adams Hill yesterday, and took a cursory and hasty glance at the mining situation there. Quite a little army of miners are at work in the numerous mines, and every one at work appears to know but little of the dull times one hears so much of in town. To a casual observer (the reporter did not go into any of the mines) it appears strange that a district so prolific of good surface indications and rich ore should have been overlooked as it was during the palmy days of Eureka district. Ore which furnaces from $20 to $300 is being extracted from five or six of the mines there, and yet there is not a single property in the section proper that has on it other hoisting facilities than the cheap windlass. From the hasty glance our reporter took of the section and the limited information he got of what is being done in the several properties that are being worked he feels safe in predicting that Adams Hill will be some day, and it may not be a great while, the best and richest section of Eureka district.

Jackrabbit District.

RICH ORE.—Pioche *Record*, April 29: A large body of rich ore was recently encountered in the Sailor's Delight mine, of Jackrabbit district. The ore has been drifted into for about 30 feet, and assays about $30, and running through the ore body is a 2-foot vein that assays from $100 to $200. The extent of the ore is not known. The Kingfisher is developing a large body of ore, and at the present time there is no telling what a day may bring forth. The ground is broken up and is such as ore bodies live in. Feeders from a half-inch to three inches in thickness are running all through the ground. The Terror and other claims of the district are looking well, and the mine owned by Takat & Fitzpatrick has a ledge six feet in width, the second-class ore going $50 in silver. One of these days Jackrabbit district will make a record as a bullion producer that it will feel proud of.

Tuscarora District.

INDEPENDENCE.—*Times-Review*, May 1: Each cross-cut 400-foot level extended a total distance of 72 feet. Upraise from the 400-foot level to connect with No. 1 shaft has been carried up 30 feet. Fair progress has been made with the repairs on No. 1 shaft.

BELLE ISLE.—Drift north from west cross-cut 250-foot level has been extended the past week 7 feet. A drift has been started south from the same point. Drift north from the east cross-cut 400-foot level advanced 10 feet. A cross-cut has been started west on the 350-foot level.

NAVAJO.—During the past week drifts on the 650-foot level have been extended 68 feet. On the 350-foot level cross-cut and drift advanced 54 feet. Work has been suspended in the south drift, east lateral vein, 250-foot level, and work will be resumed in the south drift on the east vein 150-foot level. Cross-cut west 150-foot level extended 8 feet. Fair progress has been made in all the other workings.

ARIZONA.

MILLS ETC.—Prescott *Courier* May 1: The mill of the St. Louis Yavapai Mining Company is pounding away in Humbug district, and there are a great many well pleased miners in that portion of Yavapai county. Mr. Chase is running one of his ten-stamp mills in Turkey Creek district. He is concentrating the sulphurets. The Del Pasco mill is running successfully on the ore from the Del Pasco. The Peck ten-stamp mill and pans are running on Peck tailings. The Senator mill will be taken down next week and moved to Turkey Creek district. The Conger ten-stamp mill will be started on a long run next week. Its owners have plenty of gold rock to be pulverized by it. A great many miners want them to do custom work for them. They will do so as soon as their own rock shall have been attended to. The mill is operated by water-power, so that the cost of running it will be light. The work of opening a level in the Sterling mine is progressing. Miners have great faith in the mine and are predicting that it will soon be the most valuable gold mine in this or any other Territory. The Chase mine, which is near the Sterling, is again attracting attention. It is a gold mine; rock easily worked. Mr. J. H. Brown, who has just returned from the Conger mill and Verde valley, tells us that the mill will start crushing Conger rock in a short time. Bush Bros., who are managing mill and mines, are good business men and will, Mr. Brown believes, achieve success. Twenty tons of ore from the Bullwhacker have just been worked at the mill on Lynx creek, and Mr. Brown, who was there when a clean-up was made, is satisfied that the rock paid $50 a ton in free gold. The owner of the Ethel mine, Hassayampa district, George A. Allen, who recently bought an interest, and R. W. C. Merrington contemplate making a shipment of high-grade ore to Pueblo for reduction at an early date, the recent developments having made the owners feel pretty good.

ASH CREEK.—Arizona *Miner*, May 2: Jim Vandeburg is in town from his mines on Ash creek for supplies. He informs us that there are from fifteen to twenty men working constantly in that district, and that good returns are being obtained by arastrating the ore extracted,

PLACER.—Secretary Van Arman has returned from a trip to lower Walnut Grove, where he went to inspect some rich placer ground in that locality. He reports about 200 acres of placer ground in a body, that with water could be made to pay very largely; but thinks it an enterprise which will cost considerable money to work successfully.

GOOD FOR WOOD RIVER.—Wood River *Times*, April 29: The Union Pacific and Oregon Short Line Companies have refused to give rates on ores from Blackfoot this year. This will compel all ores east of Wood River and west of Blackfoot to seek a market at Hailey and Ketchum, or a shipping point on the Wood River branch line. If the Muldoon, Little Wood River, Lava Creek, Lost River and Yankee Fork country fulfill the promises held out by the reports received from those regions from time to time, the refusal of the railroad companies to make rates will prove very advantageous to Wood River, as it will secure to us the ore yield and trade of a vast and rapidly developing region of country.

LAVA CREEK.—Prof. Delius has returned from the Lava Creek mines. He reports several claims showing rich ore, and the country roundabout the Martin mines located for miles. Money is very scarce in the new district, however, and for this reason the Proffessor does not look for it to be developed to any great extent yet awhile.

MOHAVE.—*Miner*, May 2: D. W. Grant is taking out a nice lot of ore from the Schenectady mine at Chloride. James Cadden is hard at work on the Diana mine at Chloride and is taking out some very fine ore. We hear that some parties are about to take hold of the Empire mine on a lease. Years ago this was considered one of the best mines at Chloride and we know of no reason why it should not be so yet.

COLORADO.

CLEAR CREEK NOTES.—Colorado *Miner*, May 2: Hood & Co., lessees on the Griffith lode, Griffith mt., shipped one carload of ore to Denver on Wednesday last. Syster Bros., formerly lessees on the White lode, on Red Elephant, have taken a lease on the Eclipse lode, on Chicago creek. Swanson & Co., lessees on the Seven-Thirty lode, on Brown mountain, brought down a load of ore on Tuesday last, which returned 243 and 83 ounces silver to the ton, according to class. The Orient lode on Red Elephant, is looking very promising. Carrothers and Keazy are drifting on the 40-foot level west. The breast shows a vein of mineralized quartz eight inches thick. Holbrook & Co., lessees on the Plebeian lode, on Columbia mountain, have opened up a two-inch vein of solid ore, showing considerable silver glance. McNulty & Co., lessees on the Fred Rogers' lode, have increased their force to 15 men. They have also let a contract for driving the main level ahead a further distance of 300 feet to intersect with the engine shaft on the Fred Rogers' vein. The Last Chance lode, on Douglass mountain, is a new discovery by Chris Tarpin, who has driven an adit on the vein about 30 feet, the breast of which shows a vein of solid ore two inches thick, which assays 28 ounces silver and 75 per cent lead to the ton. The Highland Laddie lode, on Red Elephant mountain, is being developed by an adit on the vein, and has been leased and bonded to Messrs. Twining and Murdoch, who have exposed about 12 inches of ore, carrying blue and green carbonates of copper and gray copper.

IDAHO.

SMALL VEINS,—Idaho *World*, May 1: Several locations have been made this spring on small veins, discovered in California gulch, near Placerville. The veins are a mile or two north-east of Gold Hill mine, and as the Gold Hill runs north-easterly, it is believed that these veins are feeders or spurs of the main ledge. The extension of the Gold Hill vein may yet be struck in California gulch or that vicinity. James McCurdy and his partner were in town Wednesday. They brought over their dust and sold it to the bank. They have been working placer ground near Henry creek, two or three miles this side of Centerville. In working the placers they uncovered a quartz vein for 75 feet. The vein varies in thickness from four inches to fourteen inches and prospects well in places. Jim will go to work in a day or two on the Storm King, a ledge discovered last fall by himself and George Carey, and in which John Lamberton owns a third interest. This location is in Lewis's gulch. James Smith, a veteran prospector, arrived here Wednesday from North Idaho, coming via Salmon Meadows and Mineral district. He owns locations in Mineral. The ore in that district carries copper and some gold and silver, but not in paying quantities.

MINING SEASON.—The *Democrat* has been misinformed in regard to the mining season of Boise basin. It says "some of the big mining companies have already suspended work after a few days' run." All are at work on this side of the basin except one or two small companies working on Last Chance Bar, and they have water for only a few weeks every season. This will not be a first-class water season, and may not be quite up to the average, but mining still goes on, and some of the claims have been running a month, and some longer.

THE GOLD BELT.—Wood River *Times*, April 29: W. H. Atkinson came in to-day from the Rock and Camp creek region, where he spent five days looking over the country, testing the veins. At Rock creek there are at least two well-defined parallel veins, between granite and porphyry, that can be followed by the outcroppings for miles. In these veins the ore occurs in chimneys, as in other veins, and Mr. Atkinson broke out a number of samples which he tested by the oldest yet most reliable test of gold prospectors, to wit, with a pan and horn. In this way he made various tests of Camas No. 1 and Camas No. 2 ore, and got dozens of colors to a horn, indicating that the gold was comparatively free and that there was considerable of it. In Camas No. 2, for which Judge Doniphan is bringing in a mill, there is a vein 14 feet wide in the shaft—of ore said to average $40 a ton. If it goes $20, Mr. Atkinson says, the "prospect" is of such a mine as will astonish the world. Besides the rich ore, there are vast quantities of low-grade ore that will take years to open up, let alone extracting and reducing. The croppings of the Camas No. 1, Mr. Atkinson says, are as much like the old Gould and Curry croppings as any he ever saw on or off the Comstock, and he has no doubt that where there is so much "blossom," as Dan de Quille calls it, there must be considerable "fruit." The Camp and Rock creek belt, Mr. Atkinson believes, begins at Resurrection district and follows in a general north-westerly direction toward the head of Rock and Camp creeks, Deer creek and on to the Smoky and Atlanta country. There will be paying mines on this belt long after the balance of the Wood River mines are worked out, if such a day ever comes.

NEW MEXICO.

NOTES.—Silver City *Enterprise*, May 1: A big strike has been made in the Bull Dog mine, at Malone. It is owned by L. A. Snyder, John McMannigil and Allan H. MacDonald. The development of the Little Mamie in Santa Rita district is steadily progressing. A shaft is being sunk 8x10 feet. Several stringers which cropped out on the surface have concentrated, and the vein shows about 18 inches of pay ore which assays one and a half ounces in gold. The Osceola at Santa Rita is developing into a first-class property. It is claimed that 11 inches of the vein will average 45 per cent lead and 36 ounces in silver. This property is owned by Jacob Long, a thorough mining man, who has confidence in his property and is now engaged developing it. The Mimbres Company's mill at Georgetown resumed operations on Monday last, having been closed down about a month. The delay was occasioned by the non-arrival of repairs ordered from the East. Another string of silver bricks will soon be started from the mill to the Eastern markets. The Pilgrim is undoubtedly one of the big mines of Grant county. A 6-foot breast of ore has been uncovered at the bottom of a 40-foot shaft which assays from 100 to 600 ounces in silver. On another part of the mine a 4-foot breast of ore of the same character and quality is being worked. Tom Levy and Walls Brothers are the owners. An experimental run of 100 tons of ore is now being made at White Oaks upon ore taken from the Vera Cruz mine, near that place. The mine is owned by a Topeka, Kansas, Company, and it contains a very large body of ore. If this run proves profitable the company will at once commence the erection of an extensive gold mill. Lincoln is the most promising gold county in the Territory.

OREGON.

ON THE BOOM.—*Bedrock Democrat*, May 2: It is authoritatively stated that all of 300 prospectors are in and about Mineral City, and they comprise expert miners from Nevada, Colorado, Wood River and other mining districts. As these mining regions are on the decline, this new field and others in Eastern Oregon attract attention, and every confidence is expressed on their part of making lucky finds in our section. It is now almost an assured fact that extensive mining machinery will be brought into Mineral this summer for the working of the rich ore, of which there are hundreds of tons on the dump of several of the mines. Negotiations are now pending for the sale of some of the valuable properties to mining capitalists, and should this be done, the camp will be the liveliest in the northwest. It would be well for all of our citizens to keep a sharp lookout as to the value of mineral discoveries in the Mineral districts, secure the ownership of properties there and sell them to good advantage when the proper times comes, which is not far distant.

UTAH.

SANDSTONE MINING NOTES.—Southern Utah *Times* April 29: The Stormont Company is working a full quota of men in the mines and the mill is constantly running ton pans on the ore extracted. The mill may shut down temporarily for repairs before long, but the report current on the streets with regard to a reduction of wages has no foundation. It was merely an idle rumor. The Christy Company employs about eighty men, and has never before shown such signs of a brilliant future. This Company's pet properties, California and Maggie, have developed into bonanzas. The ore from these mines alone keeps the mill in constant operation. A large body of high-grade ore has been opened up on the three hundred foot level which appears to improve in quantity and quality every day. There is a large body of first-class ore exposed in the stopes of the Tecumseh and Stormy King, but there will be no ore taken from these mines before the proper air connections are made, which are about completed. If the mines of the Christy Company continue to improve, new milling facilities will be in order. Miles & Richards have struck a large body of high-grade ore in the Vanderbilt. Parties who have been out to the mine say it is one of the biggest strikes that has been made by individual mine-owners around the Reef for a long time. When Charlie Miles and Dick Richards took hold of the property the ore was supposed to be about gouged out and it had been abandoned as worthless. They took off their coats, cleaned out all the old workings, and by hard and intelligent work have succeeded in developing a valuable mine. There is a force of men at work opening up the mine and taking out the ore. The boys have met with deserved success. There are a number of idle prospects around the Reef which only need the same kind of work to convert them into paying mines. Ed. Lochney is pushing things on the Bonanza, out on the East Reef. He is at present working in the north drift at the bottom of the 150-foot shaft. The drift is run in on the ledge and shows up a body of ore between six and eight feet in width. He has hundreds of tons of ore in sight in his mine, but it is low grade, averaging between fifteen and twenty ounces. He has about fifty tons of fairly good ore on the dump.

REVIEW. — Salt Lake *Tribune*, May 1: The fine weather which has so generally prevailed this spring was continued in the past week. Ore receipts, however, were light, owing to bad roads, and bullion shipments were not heavy. The shipments of the metals out from Salt Lake City for the week ending Saturday, April 25th, inclusive, were 885,500 pounds. The receipt of bullion and ore in this city for the week ending April 29th, inclusive, were: Bullion, $63,372.65; ore, $3,850; total, $67,222.65. The week previous the receipts were $90,895.07, of which $78,095.07 was bullion, and $12,800 ore. The Ontario sent in of the above 31 bars of bullion, valued at $18,235 95, making the total shipments of that company for the present year $569,341.80, out of which regular monthly dividends of $75,000 each or (with the dividend of April 30th, to be paid in New York) $300,000 in all. The Horn Silver is still dormant. The Sandstone district of Silver Reef sent $6,930 in silver bars, of which the Stormont contributed two, assaying $3,600, and the Christy two, assaying $3,330. The product of the Hanauer smelter for the week was nine cars of bullion, $20,800. The Germania sent out two cars of bullion, $4,096.70

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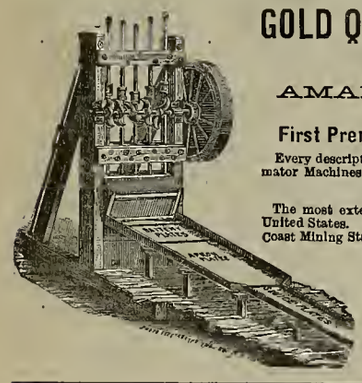

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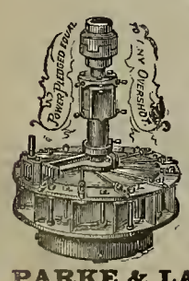

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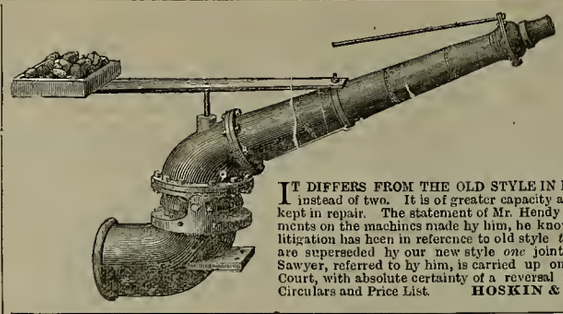

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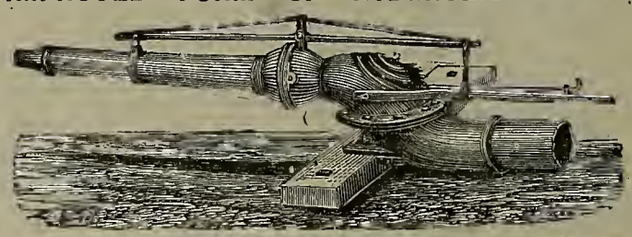

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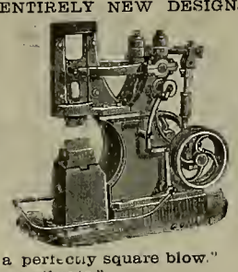

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"Requires no helper."
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"Can be run cheaply and with very little power."
"The anvil is entirely separate from the frame."
"Always ready for use."
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"Will give one blow or more as required, light or heavy."
"Does not chill the work."
"The Stroke can be changed easily and quickly."
"It is the least complicated and most efficient power hammer in the world."

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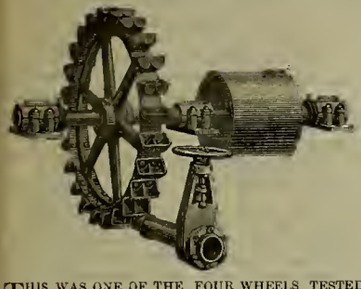

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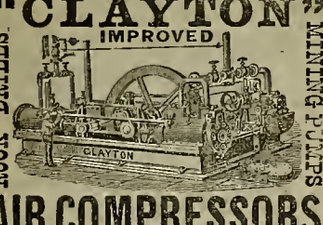

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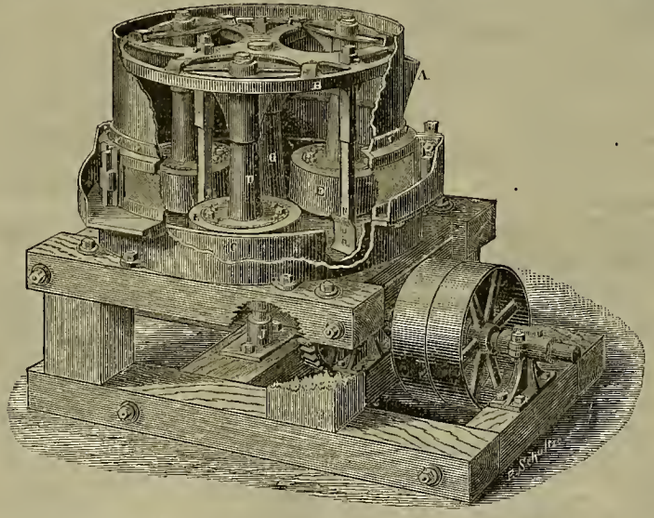

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A Glance Over the Mining Field.

The mine superintendents who met at Wood River to talk over wages, freigbts, etc., did not seem after all to favor cutting down wages below $4. Colonel Wall, W. T. Watt and Professor Jenney objected to posting notices that after June 15th wages would be $3.50. A resolution was adopted that another meeting should be held June 1st to talk the matter over and ascertain what, if any, steps should be taken to reduce the cost of mine exploitation in that region.

The Eureka Consolidated and Richmond furnaces, at Eureka, Nevada, when in full blast consume 4,000 bushels of charcoal per day.

Edward Eddy, superintendent of the Grant Smelting Works, at Denver, now a part of the Omaha Works, thinks Butte, Montana, the greatest camp since the early days of Leadville.

The Parrott mine, Butte, Montana, which has been shut down for some three months, has started up again. Between 350 and 400 men are employed.

Some 300 or 400 prospectors have gone into the Mineral City mines, Oregon, lately.

Southern Oregon expects a quartz-mining boom soon.

A New Mexico paper says that in the Sierra Company mines at Laks Valley there are tens of thousands of tons of low-grade ore in sight, which cannot be shipped, while the pockets of higher grade ores, so far as they have been developed, are pretty nearly worked out. That the mining of the bodies of low-grads will develop yet other masses or veins of the richer ores is warranted by the experiences of the past. The ground is not worked over by any means. The problem to solve is the treatment of 10 to 15 ounce ore profitably.

The 20-stamp mill being put up at Quijotoa, Arizona, will not be running before the 4th of July. A correspondent states that the camp is not "booming" as represented. There are not over 60 men employed, all told; business of every kind is frightfully overdone, and only one mining company operating in all the district. Excellent prospects exist everywhere through the mountains, and the adjacent ground is all located by different parties; but they are all waiting to see the Bonanza Company begin to ship bullion before they commence operations.

Considerable excitement has been caused at Clifton by the finding of gold in the Morning Star copper mine 10 miles east of that place.

Ex-Senator Chaffee, while testifying in the Little-Pittsburgh mining case in a New York court, in answer to a question put by one of the jurors, endeavored to explain the uncertainty of mining by stating that in this mine they found what they supposed to be some very valuable blocks of ore, but on getting into them it proved to be very poor mineral and worth very little; in fact, not sufficient to pay for taking it out of the mine.

The Walker Lake *Bulletin* says: Col. Ellis has sold the State Line mine to a New York company, under the name of the State Line Consolidated.

In the northern part of Amador county the Cosumnes river supplies all necessary power used in mining and milling, while the Mokelumne river performs like service for the mines and mills in the southern portion of the county. Near the summit of the mountains in this county are several large lakes containing immense bodies of pure water, which is led to the mines and valleys below, through the Amador canal, and other small ditches.

Somebody discovers a tin mine every now and then, but so far on this Coast none of them have amounted to much. The latest discovery is in Antelope valley, Mono county, Cal., about 52 miles from Carson. A writer in the Carson *Index* states that the whole country is excited and that locations are being made in all directions. The writer believes it to be one of the greatest discoveries ever made on the Coast. There are large quantities of the ore around the hills, and future developments will be awaited with interest.

There is more prospecting being done in the vicinity of Sierra City than at any other time in the history of the camp.

Captain Drake, of the Eberbardt, is negotiating for the purchase of the Monitor Company's mining and milling property, valued at $300,000.

Everybody in the Hay Fork section of Trinity county is excited over quartz, and several good prospects are reported.

The Grand Prize mines, Tuscarora, will be started up before long.

During the year 1884 some 207 assessments have been levied on 117 mines in California, Nevada, Utah, Alaska and Arizona. Of the assessments levied it is estimated that over four million dollars have been paid. Of this amount shareholders of Nevada mines paid $3,632,950.

A number of new locations have been made recently in White Hill district, Inyo county.

Bullion Shipments.

Mt. Diablo, April 30, $12,937; King, May 3, $8,348; Barbers Mill, 3, $4,095; Christy, April 28, $1,780; Vienna, 28, $3,980; Hanauer, 28, $4,500; Stormont, 28, $3,600; Nevada ore, 28, $1,000; Queen of the Hills, 28, $1,600; Hanauer, 29, $5,600; Ontario, May 1, $31,665; Hanauer, 1, $2,200; Queen of the Hills, 1, $5,200; Hanauer, 2, $4,300; Minnie Moore, 2, $1,000; Christy, 2, $1,790; Vienna, 2, $1,980; Germania, 1, $4,150; 2, $2,282; Hanauer, 3, $2,200; Germania, 3, $2,272. Bullion shipments from Silver Reef, Utah, for the month of April aggregate $33,391.77.

The base bullion and ore output from Salt Lake for the week ending May 3 amounted to twenty-nine cars of bullion and eighteen of ore. The bullion weighed 714,298 pounds, and the ore 502,320 pounds. There was no lead shipped last week.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
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ASSESSMENTS.

COMPANY.	LOCA	N. NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M and M Co	Alaska..	10..	35..	Apr 3..	May 4..	May 20..	T J Hay	306 Pine st
Alaska Marble M Co	Alaska..	1..	03..	Feb 25..	Apr 18..	May 16..	J M Wilde	405 First st
Alta S M Co	Nevada..	32..	25..	Apr 30..	June 4..	June 24..	W H Watson	302 Montgomery st
Buchanan G M Co	California..	12..	15..	Apr 14..	May 18..	June 5..	P J Sullivan	121 Post st
Belmont M Co	Nevada..	39..	15..	Feb 11..	May 7..	June 1..	J W Pew	310 Pine st
Champion M Co	California..	19..	08..	Apr 23..	June 1..	June 19..	T Wetzel	522 Montgomery st
Con Amador M Co	California..	9..	50..	Mar 16..	Apr 15..	May 1..	F B Latham	408 California st
Daisy Cement M Co	California..	3..	2..	Mar 28..	May 5..	May 27..	C J Collins	512 Montgomery st
Golden Fleece G M Co	California..	1..	20.00..	Apr 18..	May 25..	June 15..	F Schirmeier	Phelan Block
Iowa M Co	Nevada..	17..	05..	Apr 28..	June 6..	June 27..	C C Leavitt	510 Battery st
Julia Con M Co	Nevada..	23..	10..	Apr 6..	May 13..	June 5..	J Stedfeldt	412 California st
Loreto M and M Co	Mexico..	08..	15..	Apr 23..	May 29..	June 22..	H G Jones	327 Pine st
Mayflower Gravel M Co	California..	29..	10..	Mar 26..	May 5..	May 29..	J Morizio	328 Montgomery st
Mexican M Co	Nevada..	55..	20..	Apr 20..	May 23..	June 13..	G D Edwards	414 California st
Noche Buena M Co	Mexico..	1..	11..	Mar 27..	May 3..	May 29..	C Hart	106 Battery st
Overman S M Co	Nevada..	55..	30..	Apr 20..	May 23..	June 12..	G D Edwards	414 California st
Pinal Con M Co	Arizona..	6..	06..	Apr 10..	May 18..	June 8..	W Letts Oliver	328 Montgomery st
Puget Sound Iron Co	Wash Ter..	11..	50..	Apr 14..	May 25..	June 25..	A Halsey	328 Montgomery st
Pittsburg M Co	California..	19..	5..	Feb 28..	Apr 25..	May 15..	C J Baudmann	210 Front st
Rainbow M Co	California..	13..	15..	Mar 14..	Apr 21..	May 20..	P F Mohrbardt	307 Montgomery st
Santa Anita M Co	California..	3..	02..	Apr 23..	May 26..	June 16..	J M Buffington	309 California st
Sulphur Bank Q M Co	California..	3..	50..	Feb 25..	Apr 16..	Jun 1..	L Hermann	220 Sansome st
Summers Con M Co	California..	3..	05..	Mar 17..	Apr 20..	May 12..	F E Luty	330 Pine st
Union Con M Co	Nevada..	30..	25..	Apr 16..	May 20..	June 9..	J M Buffington	309 California st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Christy M Co	Utah..	G R Spincy	310 Pine st	Annual	May 18
North Star M Co	California..	D A Jennings	401 California st	Annual	May 13

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Kossuth M Co	Nevada..	C K Sturtevant	328 Montgomery st	06	Mar 16
Navajo M Co	Nevada..	J W Pew	310 Pine st	25	Feb 13
Plymouth Con G M Co	W Van Norden, Pres..		23 Nassau st, N Y	50	Apr 6
Silver King M Co	Arizona..	J Nash	328 Montgomery st	25	Feb 16
Syndicate M Co	Nevada..	J Stadfeld Jr	419 California st	10	May 5

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE. Apr 27-May	Portland. Rain	Temp.	Wind	Weather.	Red Bluff. Rain	Temp.	Wind	Weather.	Sacramento. Rain	Temp.	Wind	Weather.	S. Francisco. Rain	Temp.	Wind	Weather.	Los Angeles. Rain	Temp.	Wind	Weather.	San Diego. Rain	Temp.	Wind	Weather.
Thursday	.00	62	N	Cl.	.00	80	S	Cl.	.00	73	SW	Cl.	.00	60	NW	Cl.	.00	74	W	Cl.	.00	65	NW	Cl.
Friday	.00	69	N	Cl.	.00	82	NW	Cl.	.00	75	SW	Cl.	.00	58	W	Fr.	.00	71	W	Cl.	.00	65	W	Cy.
Saturday	.00	71	NW	Fr.	.00	85	N	Cl.	.00	76	SW	Cl.	.00	60	W	Fr.	.—	67	—	Cy.	.00	65	W	Cy.
Sunday	.00	75	NW	Cl.	.00	85	E	Fr.	.00	77	S	Cl.	.—	59	W	Cy	.00	69	—	Cy.	.00	66	SW	Cy.
Monday	.00	73	NW	Cl.	.00	86	S	Cl.	.00	71	NW	Cl.	.00	58	SW	Cy.	.00	72	SW	Fr.	.00	71	SW	Cl.
Tuesday	.00	72	NW	Fr.	.00	81	S	Cl.	.00	71	SW	Cy.	.—	64	W	Cy.	.00	73	W	Cy.	.00	70	SW	Cl.
Wednesday	.00	72	W	Fr.	.00	80	S	Cl.	.00	78	SW	Cl.	.00	66	W	Fr.	.00	71	S	Cl.	.00	69	W	Cl.
Totals	.00				.00				.00				.—				.00				00			

EXPLANATION.—Cl, for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature wind and weather at 12:00 M. (Pacific Standard time), with amount of rainfall in the preceding 24 hours.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Apr. 15.		WEEK ENDING Apr. 23.		WEEK ENDING Apr. 30.		WEEK ENDING May 7.	
Alpha	1.00	1.50	1.00	1.60	.90	1.05	.95	1.00
Alta	.30	.65	.25	.55	.20	.30	.15	.25
Andes	.40	.50	.30	.50	.30	.40	.30	.55
Argenta								
Belcher	1.00	1.45		1.50		1.00	1.00	1.05
Beldiug								
Best & Belcher	1.90	2.80	1.85	3.20	1.65	2.00	1.75	2.75
Bullion	.40	1.70	.40	.60	.30	.40	.35	.45
Bonanza King								
Belle Isle							.25	.35
Bodie Con	1.40	1.60	1.40	1.60	1.60	1.60	1.50	1.60
Benton	.10	.15	.10	.15	.05	.10		
Bodie Tunnel		.25						
Bulwer	.30	.35		.35	.25	.30		.30
California	.90	1.15	.60	3.70	.70	.90	.85	1.45
Challenge	.15	.40		.15				
Champion								
Chollar	3.15	4.75	1.40	4.25	1.25	1.55	1.30	1.55
Confidence	1.25	1.50		1.15		1.40	1.25	1.35
Con. Imperial								
Con. Virginia	.90	1.15	.60	3.70	.70	.90	.85	1.45
Con. Pacific								
Crown Point	1.10	1.90	1.25	1.75	1.20	1.65	1.35	1.45
Day								
Eureka Con		4.25		5.25	5 50	7.85	7.30	8.75
Eureka Tunnel								
Exchequer	.35	.45	.35	.40		.20	.30	.35
Grand Prize								
Gould & Curry	1.90	2.85	1.25	2.60	1.15	1.55	1.15	1.60
Goodshaw								
Hale & Norcross	5.77	12.00	4.10	11.75	4.50	6.50	5.25	6.00
Holmes		4.50		4.00	3 65	3.75		
Independence								
Julia	.15	.20		.10	.05	.10		.05
Justice	.25	.40				.15		.15
Martin White	.45	.60		.40		.45		
Mono	.90	1.10	1.15	1.40	1.10	1.50	1.15	1.45
Mexican	1.00	1.55	.55	1.35	.60	.65	60	.80
Mt. Diablo		4.00				3.80		3.60
Northern Belle								
Navajo	1.00	1.05	.90	.95	.90	1.05	1.10	1.70
North Belle Isle						.10	.10	.20
Occidental	1.60	2.75	1.40	1.80	1.30	1.55	1.40	1.50
Ophir	.95	1.60	.20	1.25	.50	.65	.55	1.25
Overman	.35	.40	.20	.35	.10	.15	.10	.15
Potosi	1.30	2.05	.70	1.75	.50	.65	.50	.65
Pinal Con								
Savage	3.10	6.25	2.00	6.00	2.60	3.40	2.65	2.95
Seg. Belcher								
Sierra Nevada	1.15	2.00	.70	1.50	.80	.90	.85	1.35
Silver Hill		.10	.05	.10				.10
Silver King	2.60	5.00						
Scorpion	.20	.30	.15	.25	.10	.15	.10	.15
Syndicate		.40	.35	.40		.25		.45
Tioga								
Union Con	.95	1 70	.50	.65	.45	.55	.45	.80
Utah	1.10	2.05	1.00	1.40			1.00	1.30
Yellow Jacket	1.80	2.35	2.05	2.90	2.10	2.65	2.25	2.60

Sales at San Francisco Stock Exchange

THURSDAY A. M., May 7.

70	Alpha	880	Hale & Nor	6.37@6.50
500	Alta	850	Mexican	90c@1.00
100	Andes	250	Mono	1.35@1.40
100	Bodie Con	300	N. Belle Is	10@1.15
200	Bulwer	2020	Ophir	15c
600	B. & Belcher	100	Overman	65c
1725	Chollar	1330	Potosi	15c
610	Con Va & Cal	1460	Savage	55@60c
40	Crown Point	910	Sierra Nevada	3.10@3.10
70	Eureka Con	100	Scorpion	1.20@1.45
1100	Exchequer	575	Union	20c
230	Gould & Curry	100	Utah	75c

Lost Papers.

If any subscriber fails to receive this paper promptly after making due inquiries at the Postoffice, he is urgently requested to notify this office by *letter*, that we may send the missing papers, and, if possible, guard against further irregularities.

THERE are over 8,000 Indians in Nevada.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & CO.'S SCIENTIFIC PRESS PATENT AGENCY, 262 Market St., S. F.]

FOR WEEK ENDING APRIL 28, 1885.

316,517.—WINDOW-SCREEN—William Bateman S. F.

316,733.—FLOOD GATE—J. S. Brown, Eureka, Cal.

316,443.—HARNESS—C. W. Burgtorf, Petaluma, Cal.

316,740.—CANOLESTICK—E. Carpenter, Lafayette, Or.

316,528.—PICK—Davis & Robbins, Banner, I. T.

316,450.—BLOCK PAVEMENT FOR STREETS, ETC.—H. G. Fiske, S. F.

316,902.—ROAD CART—E. E. Krenzel, Buena Vista, Or.

316,555.—WINDOW BEAD-FASTENER—Masters & Kimball, Sacramento.

316,559.—BUDDING KNIFE—K. McLennan, Berkeley, Cal.

316,803.—VEST AND OVERSHIRT—A. W. Mensor, Jacksonville, Or.

316,905.—MAP-RACK—F. P. Montgomery, San Jose, Cal.

316,651.—VEHICLE POLE—J. Pittinger, Carpenteria, Cal.

316,570.—SAW-GUMMER—J. Richardson, S. F.

316,488.—TAILOR'S SHEARS—S. C. Rugland, S. F.

316,669.—SMELTING-FURNACE—Smith & Bell, Sacramento.

316,670.—CABLE-GRIP—R. Solano, S. F.

316,918.—CENTERING GAGE—D. W. Standeford, Oakland.

316,586.—PHOTO FILE—W. Verbeck, Oakland.

316,592.—PROPELLER—J. Wooll, S. F.

12,189.—TRADE-MARK—Jay Eye See Liniment Co., S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

New Patents.

DEWEY & CO.'S SCIENTIFIC PRESS PATENT AGENCY, No. 252 Market St., S. F., has official reports of the following U. S. patents issued to Pacific Coast inventors for the week ending March 24, 1885:

PHOTOGRAPHIC OR CARD FILE.—Wm. Verbeck, Oakland. No. 316,586. Dated April 28, 1885. This holder or file for photographs, cards, etc., consists of a series of clasps arranged so that one or two will hold the card, the sets being held together by cords or links.

WINDOW SCREEN.—Wm. Bateman, S. F. No. 316,517. Dated April 28, 1885. This invention relates to that class of window-screens in which the screen material is attached to either sash by one end and adapted to be wound and unwound from a roller mounted above or below in the window casing, whereby, when the sash is opened the screen unwinds and covers the open space, and when closed it winds up out of the way. The invention consists in a cord of any metallic nature attached at one end to a pulley on the winding drum or roller of the screen, and thence passing to and around a suitably located guide-pulley and to the window sash to which it is secured, whereby the movement of the sash operates the winding drum or roller.

BUDDING KNIFE—Kenneth McLennan, Berkeley. No. 316,559. Dated April 28, 1885. This new budding knife consists essentially in a concavo-convex or gouge shaped blade having its forward end reduced to a cutting edge, said blade being adapted to cut the stock crosswise and raise the bark, and in a flat blade set edgewise longitudinally on the convex surface of the concavo-convex blade, and having its forward end reduced to a cutting edge adapted to make the longitudinal cut in the stock. It further consists in details connected with each blade whereby they are fitted together to a suitable handle. The object of the invention is to provide a budding knife that will make all the necessary cuts in the stock and to raise its bark by a single continuous operation.

Aaron's Assaying.

Those persons who have purchased from Dewey & Co., publishers, the recent work on "Assaying, Parts II and III," by C. H. Aaron, should take note of the following errata and make the corrections indicated:

Page 91.—Lines 8 and 9, for "A mixture of carbonate and sulphate," read, "A mixture of carbonate or sulphate with galena."

Page 92.—Second paragraph: Unless the lead carbonate is dissolved on the filter (see foot-note) the solution must be filtered to remove insoluble matter before adding dilute sulphuric acid.

Page 124.—The boiling with sodium sulpbits is to be done *before* passing hydrogen sulphide. All the sulphite used should be decomposed by a sufficient addition of hydrochloric acid, a little at intervals until the last addition causes no further evolution of sulphurous acid (smell of burning sulphur).

Page 158, Etc.—The percentage of copper in the oxide should have been given, as on pages 102, 79.85. For the assay it will suffice, in general, to take 80 parts of ore,

Quartz Mill Screens.

Among the industries of San Francisco which have grown to quite respectable proportions, from our position with relation to the mining field of the Coast, is that of the manufacture of screens for quartz mills. Formerly these screens were all made of wire cloth, most of which was imported, until the factories were established here. But for the past 15 or 18 years the punched or slotted screens have been preferred by most millmen, and there is quite an extensive manufacture of them in this city. In fact the demand has been such that the largest maker here has lately enlarged his establishment. The San Francisco Pioneer Screen Works, John W. Quick, proprietor, have removed to a new and commodious building at 221 and 223 First street, corner of Tehama, where new and improved machinery, punches, dies, etc., have been added.

The slot-cut and slot-punched screens have their perforations cut with absolute cleanness, and there is an entire absence of any roughness or raggedness on the under side which would cause clogging. Mr. Quick personally attends to the manufacture of these screens, and has himself invented methods of making them. With an experience of 25 years on the Coast in this business, he thoroughly understands the wants of the millmen and miners and is enabled to comply with them.

The sale of these "Quick Screens," as they are called, is not confined to the California mines by any means. They are sent to Nevada, Arizona, Utah, Idaho, Montana, New Mexico and Colorado. They are shipped also to Mexico, Australia and Alaska. The screens made here seem to be preferred by those millmen who have ever used them. These screens are stroug and durable and will stand the wear incident to quartz-mill work. They are not liable to bulge and break and discharge freely. They are made from No. 1 to No. 15 fine, and are sold at less than Chicago prices.

In addition to this branch of metal-punching, which is a specialty of these works, sheet metals of all kinds are perforated for flour and rice mills, grain and malt dryers, furnaces, chess, cement and smut mills, separators, revolving and shot screens and all kinds of milling machinery. The very best Russia sheet-iron is used for this screen work, and Mr. Quick has been awarded medals at all the State or Mechanics' Institute Fairs wherever he has exhibited his manufactures. The new establishment is much more commodious and complete than the old quarters occupied so long by the Pioneer Screen Works, and will give Mr. Quick better facilities than he before possessed.

Mining Share Market.

There is little change to record in the mining share market or in the situation on the Comstock. In the ore-producing mines the regular yield continues, and in all the working and developing mines the usual progress is made in the matter of explorations, etc. The development of the ore vein or body in the lower levels of Hale and Norcross goes steadily forward, and the eyes and ears of a very anxious public are strained to see and hear something more encouraging from that quarter, and the very latest regarding it, good, bad or indifferent, is eagerly sought. Thus far a promising vein has been developed, carrying a good quality of ore, which may be described as something better than low-grade. And at both levels the vein has widened out boldly in going to the northward toward the Savage south line; yet, although this may be considered a decided improvement in that respect, the ore itself does not improve in richness, but the average assays are not quite as high as to the south, where the vein is more condensed. This, the *Enterprise* thinks, is no unfavorable circumstance as militating against the possibilities or probabilities of finding a rich bonanza in the north half of Hale and Norcross, extending through into the Savage. All the bonanzas thus far found on the Comstock have been surrounded by plenty of low-grade ore, and none of them have commenced abruptly with high-grade ore when approached laterally in the vein. The approach to the famous Consolidated Virginia bonanza was through a long stretch of low-grade ore, and the 1,100 drift of Crown Point ran south a long distance in barren quartz and low-grade ore before it reached that rich bonanza of the south end. Perhaps it may be found advisable to sink for a still lower level in Hale and Norcross before the present ore vein materializes into a real bonanza or a paying mine.

Market Reports.

Lumber at Wholesale.

The Redwood Lumber Association has established no prices since the first of the year.

REDWOOD. Cargo prices are at present as follows: Rough, merchantable, ₱ M ft., $13 00; Rough, clear and surfaced, $23.00; 1x10 Rustic, No. 1, $24.00; 1x10 Rustic, No. 2, $19 00; 1x8 V Rustic, No. 1, $12.00; 1x6, tongued and grooved, $21.00; 1x4, tongued and grooved, beaded, $23 00; ½-in.x3, Battens (board measure), $30.00; Shingles, ₱ M, $1.65.

PINE—Rough, $15.00; No. 2, $12 00; do do in lengths, $13.00; rough, 40 to 50 ft lengths, $10.00; do 50 to 60 ft, $17.00; T and G Flooring, 1x6, $26.00; do do 1¼x0, $28.00; do do 1x4, $28.00; do do No. 2, $21.00; Vertical Grain T and G Flooring, 1x6, $30.00; do do do 1¼x6, $32.00; Stepping, $37.50; Furring, 1x2, per lineal ft, ¾ c.

Lumber at Retail.

Prices fixed by the association April 1st, are as follows:

Pine, Rough	$15 00
" " No. 2	12 00
" " " 2 in lengths	13 00
" " 40 to 50 feet lengths	16 00
" " 50 " 60 " "	17 00
T. & G. Flooring 1 x 6	26 00
" " 1¼ x 6	28 00
" " 1 x 4	28 00
" " No. 2	21 00
Vertical Grain T. & G. Flooring, 1 x 6	30 00
" " " 1¼ x 6, 1 x 4	32 00
Stepping	37 50
Furring, 1 x 2, per lineal foot	0¾
Redwood, Rough	17 00
" No. 2	13 00
" Surfaced	30 00
" " 1 x 8	28 00
" " 1 x 6	28 00
" T & C. 6 in. 12 ft and over	28 00
" " " 7 to 12 ft	25 00
" " " under 7 ft	20 00
" Rustic	30 00
" " No. 2	25 00
" T. & C. Beaded 12 ft. and over	30 00
" " " 7 to 11 ft	25 00
" " " under 7 ft	20 00
" Siding, ½ in	22 50
Pickets, Fancy	25 00
" Rough Pointed	15 00
" " Square	14 00
Battens, ½ x 3 per lineal ft	0¾
Shingles	2 00
Laths, 1½	3 25
"	3 75
Dunnage Boards less 5 ₱ delivered	16 00

Price subject to change without notice.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, May 7, 1885.

ANTIMONY—Per pound		@	—
Hallett's		12 @	—
Cookson's		13 @	—
BORAX—Refined		7 @	8¼
IRON—Clengarnock ton	25 00 @		—
Eglinton, ton	23 50 @		—
American Soft, ton	27 00 @		—
Oregon Pig, ton		@	—
Clipper Cap, Nos. 1 & 4	25 00 @	30 00	
Clay Lane White	26 00 @		—
Shotts, No. 1	26 00 @		—
STEEL—English, lb		15 @	25
Black Diamond, ordinary sizes		13 @	—
Plow		6 @	8
Machinery		10 @	12
Sanderson Bros		13 @	—
COPPER—			
Braziers' sizes		— @	25
Fire-box sheets		28 @	—
Bolt		22 @	—
Yellow Metal		14 @	15
Ingot		14 @	15
LEAD—Pig		3½ @	3¾
Bar		5 @	—
Pipe		7 @	—
Sheet		8 @	—
Shot, discount 10% on 500 bag Drop, ₱ bag		1 85 @	—
Buck, ₱ bag		2 05 @	—
Chilled, do		2 25 @	—
TINPLATE—Oldcastle		5 25 @	6 00
Charcoal		5 75 @	6 75
Coke		5 25 @	6 50
Roofing		6 25 @	13 50
ZINC—German		9 @	10
Sheet, 7x3 ft, 7 to 10 lb, less the cask		9 @	10
QUICKSILVER—By the flask	33 50		
Flasks, new	1 05 @		—
Flasks, old	85 @		—

A NEW WORK ON ASSAYING

Lead, Copper, Tin, Mercury, etc.

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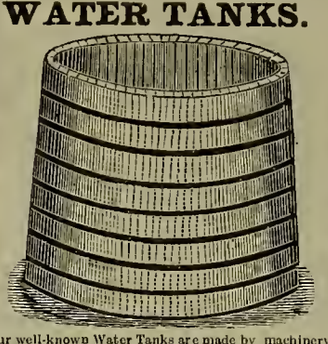
Mr. Aaron is an experienced metallurgist who has devoted many years to assaying and working ores on the Pacific side of the American continent. He writes whereof he knows from personal practice, and in such plain and comprehensive terms that neither the scientist nor the practical miner can mistake his meaning.

The work, like Mr. Aaron's former publications ("Testing and Working Gold and Silver Ores," "Leaching Gold and Silver Ores," and "Assaying—Part I") that have been "successfully popular," is written in a condensed form, which renders his information more readily available than that of more wordy and less conscientious writers. The want of such a work has long been felt. It will be very desirable in the hands of miners, assayers, prospectors and millmen.

The following abstract of the table of contents will show how comprehensive the work is: Gold and Silver Bullion; Apparatus; Melting Bullion: Assaying Bullion: Humid Assay of Silver; Manipulation, etc.; Lead Ores; Copper Ores; Volumetric Assays; Parkes' Process; Amalgamation; New Process; Preparation of Potassium Xanthate; Electrolytic Determination of Copper in Ores, etc.; Assaying of Tin Ores; Assaying of Mercury Ores; Assaying of Zinc Ores; Assaying of Zinc Ores, New Method; New Assay of Nickel and Cobalt; Assay of Chromium; Assay of Bismuth; Assay of Arsenic; Assay of Antimony; Assay of Sulphur; Assay of Salt; Appendix to Part I; Notes on Crucible Assays; Weighing by Oscillations; Appendix to Part III; The Assay of Lead; The Assay of Copper.

There are 160 12mo. pages with illustrations in the volume, which is bound strongly in cloth. Price postpaid, $1.75. Sold by DEWEY & Co., Publishers, No. 252 Market St., S. F.

WATER TANKS.



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Reamers for taking fasteners out	35

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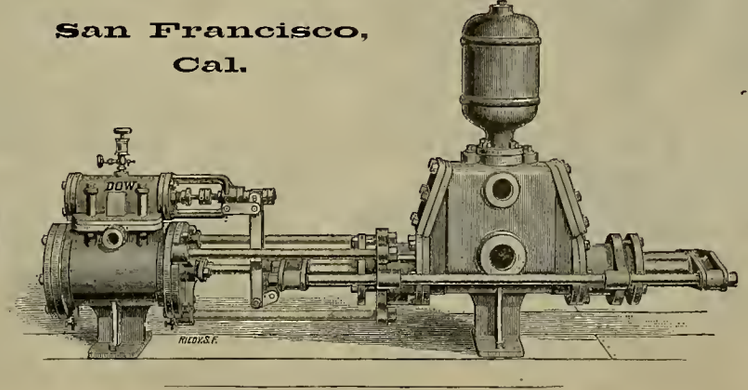

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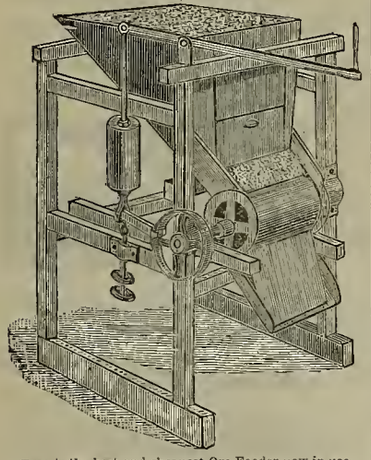
[Patented May 28, 1882.]



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It has fewer parts, requires less power, is simpler in adjustment than any other. Feeds coarse ore or soft clay alike uniformly, under one or all the stamps in a battery as required.

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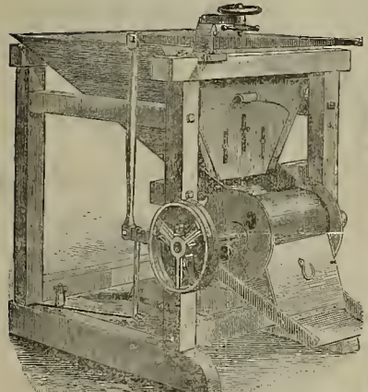
Roller Ore Feeder.

(PATENTED JUNE 24, 1873.)



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☞Prices furnished upon applicatioo to

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Consumers are respectfully informed that owing to inferior brands of Coke having been sold in this and otber countries under the name of "Patent Coke," the Glamorgan Coal Co. (Limited), Cardiff, in May, 1884, abandoned the title of "Patent Foundry Coke," substituting that of "Hood's Foundry Coke."

This Coke is exclusively used by the Selby Smelting and Lead Co., Union Iron Works, Professor Thomas Price, and other consumers here. Large quantities are regularly forwarded to Copper Smelters in Arizona and New Mexico, and also to consumers in Nevada and Salt Lake.

The undersigned are tbe SOLE IMPORTERS of the above Coke, which is for sale in quantities to suit purchasers.

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316 California St., San Francisco.

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Economy in space and fuel. Safety at high pressures. Freedom from scaling. Equally adapted for power and heating purposes. Especially adapted for mills, factories, hotels, stores or any place where safety is a necessity. Will work well with muddy water and any kind of fuel.

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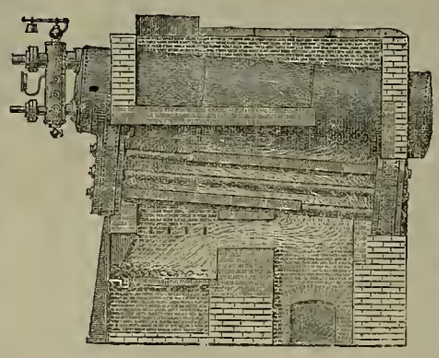
(Signed) W. S. TOWNSEND.



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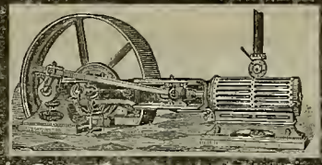

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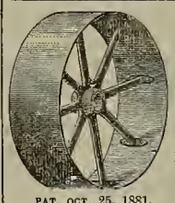

PAT. OCT. 25, 1881.

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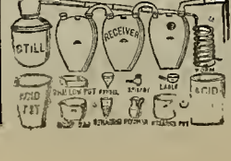

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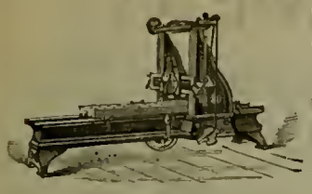

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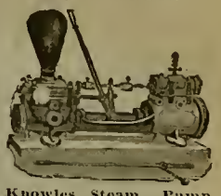

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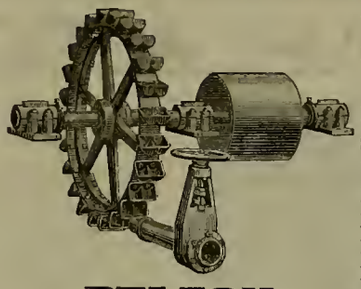

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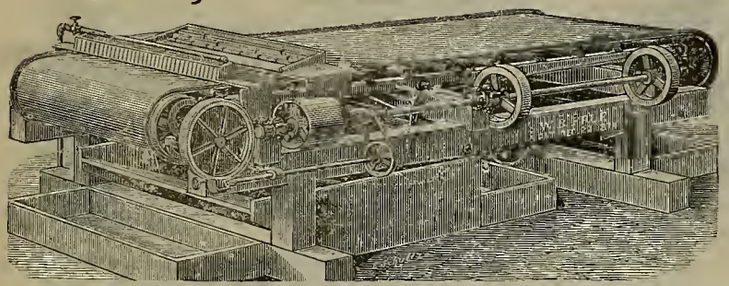

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As the result of a suit East against an End-Shake Machine (the Embrey), similar to the Triumph, the Frue Vanning Machine Company owns the Embrey patent, and can put in the market an End-Shake Machine of earlier patent that will do as good work as the Triumph, and superior in construction and durability. There will be no risk of suit for infringement.

The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement on patents owned by them.

Protected by patents May 4, 1869, Dec. 22 1874, Sept. 2, 1879, April 27, 1880, March 22, 1881, Feb. 20, 1883, Sept. 18, 1883. Patents applied for.

N. B.—We are and have been ready at any time to make a competitive trial against the Triumph, or any other Concentrator for stakes of $1,000.

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$1,000 CHALLENGE ACCEPTED!

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These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with accurate deductions therefrom, will soon be published in Circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and we hereby accept the Challenge of $1,000, flaunted by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

We guarantee purchasers against all costs, expenses or charges incurred by reason of any infringements of any existing patents.

"Put up or shut up," and "Let the Best Machine win!"

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For COPPER and ARGENTIFEROUS LEAD ores of NEW and ORIGINAL DESIGNS, covered by LETTERS PATENT. No other Furnace CAN COMPARE with these for DURABILITY, and in CAPACITY for uninterrupted work. MORE THAN 150 of them are now RUNNING in various parts of THIS COUNTRY, as well as many in FOREIGN COUNTRIES, giving results NEVER BEFORE ATTAINED as regards CONTINUOUS running, ECONOMY of fuel, AMOUNT and QUALITY of BULLION produced. These CLAIMS have been PROVEN BY RESULTS in ANY NUMBER of INSTANCES, and the GREAT SUPERIORITY of this SYSTEM of smelting ores DEMONSTRATED BEYOND QUESTION. COMPLETE PLANTS furnished to order of any CAPACITY, with ALL IMPROVEMENTS that experience has DEMONSTRATED as VALUABLE in this class of work.

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This machine has been THOROUGHLY TESTED for the past TWO YEARS, under a GREAT VARIETY of CONDITIONS, giving most EXTRAORDINARY results FAR IN ADVANCE of anything EVER BEFORE REALIZED. A recent COMPETITIVE TEST at the Carlisle Mine in Mexico, showed an ADVANTAGE OF OVER 30 PER CENT in favor of THE DUNCAN. The amount SAVED OVER THE FRUE being sufficient to PAY THE ENTIRE COST of the machines EVERY MONTH OF THE YEAR. One of its MOST VALUABLE features is as an AMALGAMATOR. It saves all THE AMALGAM GOLD and SILVER that ESCAPES the BATTERIES, PANS or SETTLERS, making the machine worth MORE than ITS COST for THIS PURPOSE ALONE.

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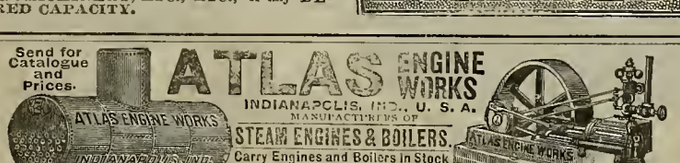
STEAM ENGINES & BOILERS.

Carry Engines and Boilers in Stock for immediate delivery.



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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, MAY 16, 1885.

VOLUME XLXX Number 20.

Dow's Improved Pumping Engine.

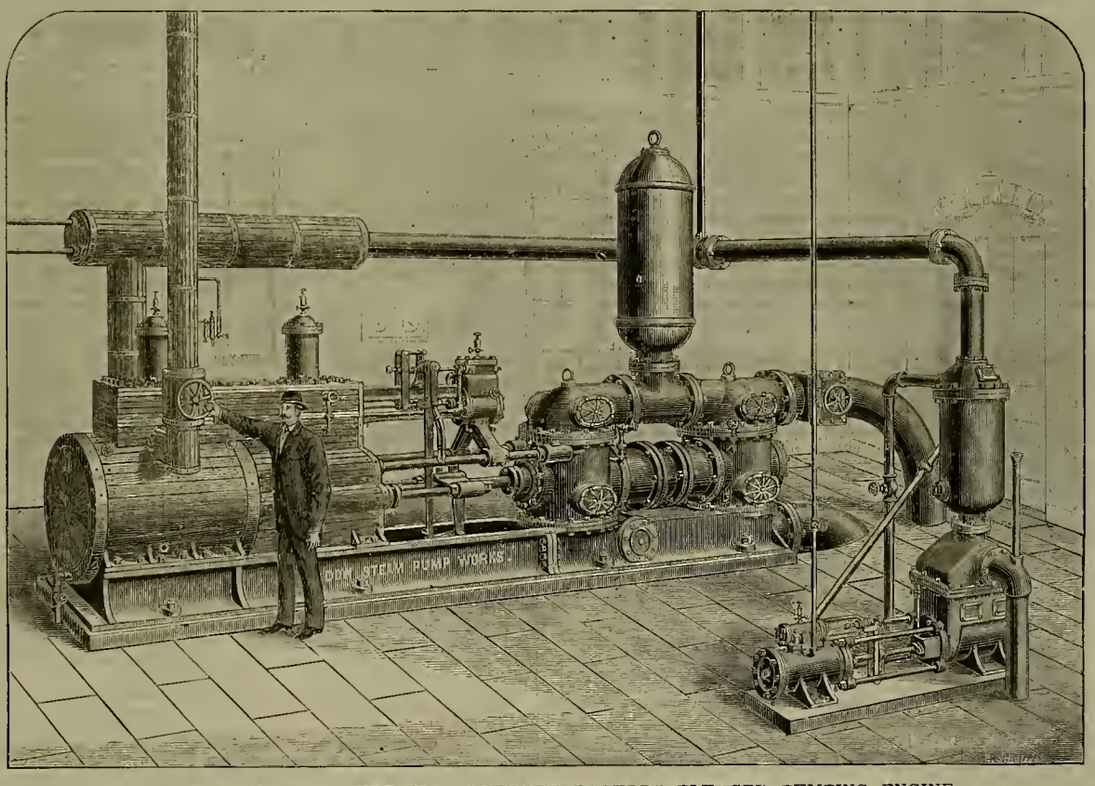
Among the great variety of adaptations in pumping machinery manufactured at the "Dow Steam Pump Works" in this city, we call the attention of our readers to the special construction of compound pumps with independent condensing apparatus, suitable for water-works purposes.

The cut shows the general arrangement of a first-class compound and condensing "outside packed" plunger pumping plant for high service, developing the greatest economy. These pumps operate smoothly under the heaviest lift. The operating expenses and repairs are remarkably small, while the chances for derangement are reduced to a minimum.

The firm is adapting this class of pumping engine, of either the piston or plunger pattern, to both high and low service, and guarantee for the outlay the highest possible degree of economy. A large number of their plants are now in successful operation in California, Oregon, Washington Territory, Arizona and Mexico, and are very strongly endorsed by engineers of the most approved experience as superior in every way.

This class of pumping engine with independent air pump and condenser, as shown, is applicable, with such modifications as are best adapted to the peculiarities of each situation, to either high or low service water-works purposes of either the reservoir, stand-pipe or direct pumping systems. No expensive foundations are required. This class of pumping engine is applicable to daily capacities of 200,000 to 2,000,000 gallons and upward. The pump of which the accompanying engraving is a representation began its work by pumping 100,000 gallons an hour at the Seattle water-works.

This is only one of the varieties of steam pumps made by the Dow Steam Pump Works, which from a small beginning a few years ago has grown to large dimensions, the pumps having come into great favor by their efficiency and durability.



DOW'S COMPOUND CONDENSING "OUTSIDE PACKED" PLUNGER PUMPING ENGINE.

"The Compulsory Coinage of Silver" is one of the subjects to be discussed at the National Commercial Convention, at Atlanta, Georgia, on the 19th inst. Colorado will send representatives so that the silver side of the question will have suitable adherents.

D. W. F. Bisbee, of the firm of Bisbee and Williams, engaged in copper mining operations in Arizona, died in this city last week. He gave the name to the town of Bisbee, Arizona, and was well known all over the Coast in the mining regions.

Foundry Notes.

At the Fulton Iron Works, Hinckley, Spiers and Hayes have just shipped a 30-stamp mill to Mexico. The mill is to be run by water-power, turbine water-wheels being used. The entire frame of the battery is made of iron, as wooden frames shrink out of shape in that hot country. The castings are all made small, for handiness in transportation. They are putting up a 5 stamp mill at Digget, San Bernardino county. It is a silver mill with pans, settlers, etc. The Works are doing the whole thing, milling and all.

Two large steel boilers are being finished up for the U. S. Coast Survey Steamer Hassler. They are also building the machinery for a new steam schooner for the coastwise lumber trade. The machinery is heavier than any so far put into the coasting schooners for auxiliary power. It is a vertical compound surface condensing engine, with a 11-inch high-pressure cylinder and 22-inch low-pressure cylinder, 22-inch stroke. The boiler is 8 feet in diameter and 9 feet, 6 inches long.

Among other marine work is the machinery for the new steamer General Grant which is to be used by the fishermen outside the heads. No sails are to be used on the vessel and no masts have been put in. She is to go outside and bring fish in every morning. The steamer is of good size and nearly ready for use. A small steam engine is to be used for hauling nets.

This foundry is doing about 750 tons of casting work for Peter Donahue's new building on Mission street between Fremont and First. It consists mainly of columns and fronts. There are about 250 tons of interior columns in the job.

Manufacture of Sulphate of Alumina.

In the manufacture of sulphate of alumina the aluminous materials, such as schists, clays, etc., are treated in the powdered state, either before or after roasting, with the requisite amount of either cold or hot sulphuric acid. In most cases a violent reaction will ensue and the aluminous material will be decomposed by the action of the acid, by which silica will be set free, and a combination of alumina, and of such other bases as may be present formed with the sulphuric acid, whereby will be produced a more or less pure sulphate of alumina. This product may be either run into cakes, which, after hardening and after being more or less broken up, will form an article of commerce known as "aluminous cake"; or, after diluting said product formed by the treatment of aluminous materials with sulphuric acid with water, the silica may be allowed to settle, the clear supernatant liquor drawn off and boiled down, or concentrated to such a strength that it will get hard when cold. The product of each of these processes is the sulphate of alumina of commerce. Sulphate of alumina as usually made contains more or less free acid. This free acid is an objectionable feature and is positively harmful when the alum cake or sulphate of alumina is to be used as a sizing material in the manufacture of paper. It will corrode the apparatus employed and destroy in a greater or less degree certain materials used in the manufacture of paper, such as ultramarine blue. It is necessary to have a neutral or basic solution of sulphate of alumina if it is desired to remove iron therefrom by some of the known processes for this purpose.

Conrad Semper, of Philadelphia, has recently obtained several patents for manufacturing sulphate of alumina. By one of these patents he produces a neutral porous sulphate of alumina containing magnesia, for sizing and other purposes. This patent covers the process of making a neutral porous sulphate of alumina, containing sulphats of magnesia, which consists in treating a hot solution of sulphate of alumina of such degree of concentration that it will harden when cold with carbonate or bicarbonate of magnesia. In another patent he covers the method of making a neutral or basic alumina-magnesian compound which consists in treating a hot acid solution of sulphate of alumina with magnesia carbonate, bicarbonate or oxide. This neutralizes the free acid present. The magnesia will unite with the free acid, as long as any remains, and after saturating all the free acid, if any surplus of magnesia should be present it will take up from the neutral sulphate of alumina as much acid as will be necessary to transform all the magnesia present into a sulphate of magnesia, leaving a soluble basic sulphate of alumina intimately mixed with the sulphate of magnesia thus formed.

The same inventor has a system of producing a *porous* sulphate of alumina containing zinc, and at the same time he obtains a neutral article in which the iron is reduced in whole or part to ferreous oxide, should ferric oxide be present in the clay from which the alumina is made he discovered that by adding a solution of ferruginous sulphats of alumina of such degree of concentration as that it will harden when cold, and just before it commences to thicken a certain quantity of sulphite of zinc, he obtains a mass in which the iron, which has been present in the aluminous material as ferric oxide, is reduced to ferreous oxide, and which is at the same time interspaced with small cavities, in which cavities sulphurous acid gas is contained. If this porous sulphats of alumina is used in paper-making it is readily soluble on account of its porosity. The claim allowed on this patent is, "The process of manufacturing porous sulphate of alumina, containing sulphite of zinc, which consists in adding sulphite of zinc to an aluminous solution made by treating an aluminous material with sulphuric acid, and from which silica has been removed, and which is of such degree of concentration as, when cold, to harden."

Mining Bureau Trustees.—Wm. Irelan has been chosen chairman of the trustees of the California State Mining Bureau, and Sol. Heydenfeldt, Jr., vice-president. The other trustees are Z. Z. Davis and Walter E. Dean.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Shasta County Mines.

EDITORS PRESS:—Shasta county was noted for the extent and productiveness of its placers in the early days of gold-digging. Even now placer mining is carried on in some sections of the county with good results; and there is considerable territory that will pay from $1 to $1.50 per day as yet untouched. Treading in the footsteps of her sister mountain counties, however, Shasta county has learned that her hopes for the future must rest upon quartz, and that the benefits arising from placer mining are ephemeral and unsubstantial. From the developments already made in vein mining, a career of great prosperity is opening before her. The large production of placer gold, already referred to, presents convincing evidence of the existence of rich auriferous veins in the mountain system of this section. All who have studied placer gold deposits are satisfied with the simple and obvious inference that the gold has been derived from the erosion or wearing away of the higher rocks and the breaking down of quartz veins, the debris being sorted and deposited by water according to its specific gravity. We always find placers lying adjacent to and below districts traversed by auriferous veins, and nowhere else, and the placer gold itself shows traces of having been torn away from its parent ledge in its rolled and rounded surface.

The actual results and developments of quartz mining in Shasta county bear out and confirm the geological facts above given. At the heads of the gulches which were rich in placer gold, fine veins of gold-bearing quartz have been discovered and profitably developed.

French Gulch is a striking case in point. This gulch paid at the rate of $100 to the running foot to the old gold diggers for its entire length. At the head of the gulch rich quartz was first struck in the Washington mine. This mine has been worked for many years with great success, and an immense amount of underground work has been accomplished. Owing to the tunnel system without air-shafts for ventilation, foul air has accumulated to such an extent in the lowest workings that the extraction of ore is slow and costly. By proper modernized methods of development there is no doubt that this mine could be made very productive. The improvements consist of a good 5-stamp mill operated by water-power. Following up the gulch the Niagara mine is reached. This is a consolidation of numerous pieces of ground, all owned by a San Francisco corporation known as the Niagara Mill and Mining Company, in which Mr. W. T. Coleman is the leading spirit. There are a 10-stamp steam mill, and a cannon-ball mill on the premises, with an aggregate crushing capacity of about 30 tons per day. The mine is a close corporation and bullion yield is hard to obtain, but outsiders put it at $20,000 per month. About 60 men are employed, all white, Mr. Coleman showing a preference for white miners, which is in marked contrast to some mine-owners who employ Chinese to the detriment of the mines and the demoralization of the young people and children in the immediate vicinity.

Near the Niagara is located the Scorpion mine, a promising claim; the Meyers claim, which shows up a large body of ore estimated at $100,000; the Green mine, running regularly with a cannon-ball mill; the Brunswick and other good mines. The formation is slate and porphyry, and the ore is generally found on the contact. The average is high, say $40 per ton. The ores carry a considerable percentage of sulphurets, which are rich in gold.

What has been demonstrated by following up French gulch has been repeated in other parts of the county. Squaw creek has been followed up to its source and large and valuable veins of quartz discovered. Some of these are from 6 to 10 feet in width and pay the fortunate discoverers good daily wages, with a hand mortar. On the south side of Squaw creek, at an elevation of about 700 feet above the bed of the stream, is situated the celebrated Balaklala mine, which is destined to become famous in the annals of gold mining. This is one of the largest veins in the county. It is believed to cover the whole surface width of the claim, 600 feet. At any rate, no walls have yet been found. The ore is rusty, black, porous gossan, carrying free gold and metallic silver. The average value per ton in gold is $12.50, and in silver $15. The presence of the silver is owing to the decomposition of nodules of silver sulphurets scattered through the mass, while the gold seems to be associated with the iron ore, resembling in this respect the remarkable gold mine recently discovered in Queensland, Australia, and leading to the belief that the precious metal has been deposited by geyser springs coming to the surface bearing in solution gold, silica, iron, alumina, etc. There are at least 75,000 tons of ore developed at present. Milling operations will soon be inaugurated. It is estimated that $4 per ton will pay all costs of mining and milling. Estimating the yield at 80 per cent of assay value and we have $22 per ton. Deducting from this $4 per ton for working, and we have $18 per ton profit, and "in sight" a profit of $450,000. The formation is feldspathic porphyry, in some places showing beautiful deposits of kaolin. This mine is one of the remarkable sights of Shasta county.

On the eastern side of the Sacramento river in the "Old Diggins," many valuable gold quartz mines are in operation, the leading ones being the Florida, O'Neal, Mammoth, Central and Harrison. In the southern portion of the county near Ono, on the Cottonwood creek, the principal gold quartz mine is the Spencer, situated about eight miles from Ono. Here considerable work has been done and a large body of quartz uncovered. At present the pay chute is nine feet in width, averaging $30 per ton. Defective milling facilities have heretofore retarded development. A good stamp-mill is to be erected this summer and then the yield of this mine will add greatly to the bullion product of the county. The vein lies between slate and porphyry.

At Bullychoop, above the last mentioned mine, considerable prospecting work is being carried on and good gold specimens are occasionally brought in. Owing to the mountainous nature of the country development is slow, but a good wagon road is now under construction.

The shipments by Wells, Fargo & Co's Express for 1884, of gold dust and gold bars from Shasta county amounted to $360,568. When we take into the account the amount carried out by private hands, the aggregate will reach nearly $500,000. The present year will witness an increase of 50 per cent on this amount. The outlook was never better for quartz production. Shasta possesses good climate, cheap labor, railroad transportation throughout its entire length, with an abundance of water-power, as well as cheap fuel for steam and mining purposes, and it presents to-day a most attractive field for investment. B. B. M.

Redding, Shasta Co., May 5, 1885.

Too Many Miners at Butte.

EDITORS PRESS:—You will confer a great favor to many miners throughout the country by warning them through your excellent paper against coming to Butte in search of work. There are at present hundreds of idle men here unable to get work, and more are coming in every day, induced thereto by the rose-colored representations in the local papers about the boom and prosperity Butte is enjoying.

The fact of it is that while there are a few buildings going up, three or four of the best mines which but lately employed 200 and 300 men are now shut down, the Lord and the managers only know for how long. The men are running in gangs here from two and three up to a dozen, and as many as 20 and 30 can be counted at one time round every hoisting work supplicating for work which they cannot get, and those who are "busted" have a hard time of it "sparring" round for one square meal a day. Almost every one of them are pouring sulphur-perfumed blessings over the city and wanting to get away, but having no money and not wanting to count railroad ties on an empty stomach—they do the only thing left open to them, remain and burn it through. MINER.

Butte, Montana, April 30, 1885.

Arizona Mining Laws.

The Territorial law just passed provides as follows: That locators place a substantial stake or monument of a permanent character at each end of the ground claimed, and others as near as practicable along the course of the ledge, and also similar objects at each corner of the claim; said stakes to contain in a conspicuous manner the name of the claim and notices to be placed in monuments as heretofore. The line of stakes along the ledge shall not afterward be changed so as to affect the rights acquired by others. All locations must be recorded within 60 days.

Recorders are to receive for recording the sum of one dollar for the first folio, and 20 cents for each additional folio. It also provides for the indexing of all locations made and to be made.

It further provides that before 60 days after the period fixed by the United States law for annual expenditures (assessment work) upon claims, claim-owners may file with the Recorder of the county an affidavit setting forth that the full amount has been expended, as required by law, and containing a concise description of the character of such work, and in and for what year. From the time of the filing of such affidavit, the same shall be *prima facie* evidence of the facts therein stated, and shall impart notice thereof to all persons; also, when one partner does not come to time with his part of the assessment work, the other may do it and file notice of having done the same with the Recorder, he to keep an alphabetical list of such affidavits.

This law applies to placer claims.

The law goes into effect three months from the date of its passage.

The Bellevue *Chronicle* is informed that the Philadelphia company will this season erect a large concentrator and matte furnace out at their Little Smoky properties. The concentrator is already en route.

The Sierra Buttes Gold Mine.

Working Low-Grade Gold Ore in California.

The Sierra Buttes Gold Mining Company is an English organization, working mines in this State. A general meeting of the company was held in London last month, when some interesting facts were presented.

The chairman, Mr. F. Tendron, said before moving the adoption of the reports and accounts, he would give them all the information in his power regarding the working of the past half, and the probable result of the present half-year, and as far as one could see a short way into the future. The tonnage stamped during the past half-year was 29,740 tons, a large increase as they were led to expect over the average of former periods for some time, at all events for several half-years. The value of the gold and silver in that mineral was $6.12 as against $7.50, the average of seven preceding half-years. In English money, and taking the the dollar at 4s., for convenience's sake, it was 24s. 6d. against 28s. 2d., a falling off as they would see, and small as the falling off was it was of considerable importance, but the reason of the falling off was a satisfactory one in its way. It was not that there was a falling off during that period in the value of the ore from the Mammoth shoot, or of the ore from the bodies between the eighth and seventh levels. The ore stamped in the Yuba was entirely ore taken from between the eighth and seventh levels, and that averaged $7.50 a ton, which was a very good average. He thought almost all of the reports they had had as to the probable value of the ore of the Mammoth shoot gave the average at something like $7 to $8; so far it was satisfactory, but the ore that was milled in the Hitchcock mill, the bulk of which was taken from the seventh level, was of poor quality. The bulk of the ore was taken from various parts of the mine along the main shoot, which was known to be poor between the seventh and sixth levels. The average of the ore crushed by the Hitchcock mill was only $4.21, or about 16s. 10d., per ton. Poor as this was it gave a profit and reduced the average working cost.

The average working cost for the six months was $3.20—15s. of our money, as against $4.43 or 17s. 10d. of our money, so that poor as the ore was it still gave a profit of 1s. 10d. a ton, and brought the mining and milling costs down considerably because of their being enabled to stamp a much larger quantity of ore. In these figures he had excluded the expenditure on the 9th level; it was an exceptional expenditure, an expenditure that was entirely for the future. A very fair amount was charged during the period for prospecting and dead work. The amount thus expended, in addition to the amount they had charged as outlay on the 9th level, was close upon 9,000*l.*, so that it really had been a very satisfactory half-year to have been able to spend on developments 9,000*l.*, and yet show a balance of profit and loss for the half-year of 6,500*l.* That was a very fair half-year, but with such good figures they might very fairly say: "Why, then, don't you give us a dividend at the rate of five per cent, which would take but little over 6,000*l.* out of 6,500*l.*, you show as a net balance for the working of the half-year, and particularly as you promised us a better dividend?" He owed them a very full explanation of why; after due consideration they came to the conclusion that they should only pay a dividend at the rate of two and a half per cent per annum, the same rate of dividend as they had been paying for a short time previous. Those reasons were partly mining and partly financial. He would deal with the mining reason first, premising what he was going to say on the point, with the remark that it was very undesirable to increase the rate of dividend unless they saw that they could maintain the increased rate. The mining reasons were chiefly arising from the horse which had split the lode in the 8th level much sooner than anticipated. He told them what the result was at the last meeting, but he said that he felt, as far as a man could feel, satisfied with that which he could know little about if they could find a good ore west of the horse; and they had gone through a period since that meeting with a certain amount of anxiety to have that expectation fulfilled. Up to the time they had decided on the rate of dividend it had not been found. The expenses were very heavy, driving in the body of the quartz, in addition to the expense of driving under the footwall. They had driven the tunnel a considerable distance, a fair distance in the hard body of quartz, but up to the time they had to decide on the rate of dividend they had not met paying ore. They got a vein which was good and contained sulphurets and a little gold, but not enough to pay. He was very happy to say they had good ore now in the lateral drifts which ran nearly parallel. They had a fair body of ore there and in the selvage; they were driving in the footwall; they had also a body of ore now making its way upward. They met it in the floor of the tunnel. It was gradually rising, and the latest news they had was that it was about four feet wide, 6-dollar ore. So far they had reason to be satisfied, but in the meantime the produce had been below the average. The quality of ore that they had been obliged to work to keep the Hitchcock mill going, and the poorer quality of the ore they had met with in the Mammoth shoot and the inability to mix that with better ore from stopes that they expected to have had above the house, had brought down the average monthly produce to something like $30,000, and the very heavy expenses of driving the lateral drifts to the eighth level and the seventh level, and the necessity now of charging the expenses of the ninth level also to the revenue, left too small a profit for three months' working of this half-year for them to see their way at all clearly to carry out the financial undertaking that they had made, and give the shareholders at the same time a dividend of five per cent. They could have given five per cent on this occasion, but they could not at present see that they would be able to give it in October.

As soon as the additional twenty stamps were fitted up in the Yuba mill, which would be in about May, they would stamp at the mill about 4,500 tons a month; they would probably shut down the Hitchcock mill. There was very little ore more than it could work, and such ore as it got at the eighth and seventh level it got at a heavy expense, and they could send that along the eighth level into the mill as that they would probably shut down the Hitchcock mill, and merely work the Yuba, where we have 60 stamps, and be able to stamp 4,500 tons a month. Taking the average value of ore at as low a rate as $7, they would then be able to earn a monthly sum of between $11,000 and $12,000. From that amount they really had to take off a certain amount for agency expenses, bullion charges, debenture interest, income-tax and London charges, so that they must not be guided by the figures they received and suppose it was an amount available for dividend. The only doubt in his mind was whether, so soon as the 1st of July, they would have laid open sufficient bodies of ore to enable them to feed the mill with such a large quantity as 4,600 tons monthly, and how it was that they had to consider what might reasonably be expected as this amount of ore that would be laid open by the ninth level. That level had been driven now for over three years, and had cost them 20,000*l.*, of which they had paid 20,000*l.* out of revenue, and it had not, up to the present, benefited them to the extent of a single sovereign. It had not yet reached the ore bodies that they had driven it for the purpose of reaching. The first ore body would probably be met with in the course of the next two months. The first body that was met with in the 8th level was at the junction of two veins, the North Cliff and the Ariel. The 9th level was being driven in the Ariel, whether the North Cliff would be near it or not they could not say; if not, they would have to drive a cross-cut to meet it. There was one other matter that he had to bring before them that he thought was of a very satisfactory nature, and would certainly help them very much in obtaining the returns he had alluded to, and that was the successful treatment of the sulphurets that had been found in the 8th level by the chlorinating process. It would be seen by the report about four tons had been treated in that way, and they gave a net profit of something like $320. They had accumulated about 150 tons of the sulphuret tailings, which Mr. Johns put down as being worth £6,000. That was a most important thing, and Mr. Johns hoped to make a permanent profit from the same source, and if that were the case there would be no question as to their ability to carry out the scheme he had mentioned of being able to pay a dividend of 5 per cent, and in two years discharging the £20,000 of obligations. Referring to the Plumas Eureka, he told them at the last meeting, although they had to submit to a reduction in dividend, he could not feel at all desponding of the future of the Eureka mine, and although things did not look very brilliant, yet such a good body of ore had been opened out in the outside mines that they might cheerfully look forward to the future, but they might expect, during the half-year, or early part of the present year, some very low returns, and they would be dependent on the Eureka mine proper, and the ore available would be small in quantity and poor in quality.

That had been the case; nearly 80,000 tons had been stamped during the half-year, and about 10,000 of that came from the Eureka proper and was of poor quality, to their great surprise; and much to the surprise of their officers abroad, they had been able to work the outside mines all through the winter right up to the present time, and the result had been that they had made uncommonly good profits. The produce in free gold and silver at the Plumas for the six months was at the rate of 7.27 per ton, as against 6.92 for the preceding seven half-years, and the mining and milling cost was 4.32 against 3 73. The cost was above the average, because of the large amount of prospecting and dead work that had been done in connection with the Eureka tunnel and with the outside mines.

LET HER BOOM.—The Downieville *Tribune* says: Judging by the talk we heard in San Francisco, Sierra is attracting more attention in the mining circles there than any county in the State. And why not? There are rich gravel channels threading their way through all these mountains, and there are thousands of untouched quartz ledges that are simply waiting to yield their treasures to the delving miner. If we mistake not the signs of the times, there will be a boom in mining in this county this summer. Let her boom.

About 24 tons of concentrations have been shipped to Colorado from the Paradise Company since the rebuilding of its works and the resumption of the reduction of its stores of ore.

MECHANICAL PROGRESS.

The Nail Trade.

Less than a century ago all nails were hand made. Now there are 80 nail factories in the United States running over 6,000 machines, with a capacity, if all were steadily employed, of over 12,000,000 kegs per annum. The largest annual product was 6,147,000 kegs of 100 lbs. each in 1872.

Nails are made in some 17 States of the Union. Among the latest States to enter upon this industry are Wisconsin and California. The latter entered upon nail-making in January, 1883, with 50 machines.

Nail Imports of California.

Up to within the past two years, all the nails used on this Coast were imported from the East. The imports at San Francisco in round numbers for the past twenty-two years have been as follows:

1863, kegs	95,000	1874, kegs	215,700
1864	94,400	1875	232,100
1865	70,300	1876	181,800
1866	103,100	1877	213,000
1867	190,800	1878	223,000
1868	158,200	1879	162,000
1869	170,600	1880	192,800
1870	103,900	1881	259,800
1871	150,200	1882	200,700
1872	225,000	1883	178,200
1873	129,000	1884	101,700
Total, 22 years			3,651,300

The imports for the last eleven years show an increase of 45 per cent over the first eleven years. The real increase has been larger, because some of the cities of the interior, which formerly drew their supply of nails from San Francisco, have lately been importing considerable quantities direct from the East. Over 30,000 of the import of 134,000 kegs by California in 1884 dropped off at the various terminal points in the interior.

Nail-Making in California.

The estimated annual consumption of nails in California has varied from 85,000 kegs in 1865 to 259,000 kegs in 1883. These figures show a monthly consumption varying from 7,500 kegs to 21,600 kegs. Dealers have been accustomed to carrying a stock of 6,000 to 60,000 kegs. Now that supplies are obtainable in California, the hardware men allow the manufacturers to carry the burden of stock. It will probably be a long time before California cuts entirely loose from Eastern supplies of this manufacture, though it is stated that the local factory has sufficient capacity to meet all the demands of the Coast.

This factory is located at Oakland, and was erected in the closing months of 1882. It is supplied with the latest improved machinery. The building is two stories high, and the machines are placed in the second story, the nails dropping through apertures in the floor to reservoirs on the first floor. A rolling-mill is attached to the works, so that the iron is prepared and all the operations completed at the same point. There is also rail connection direct from the factory with all parts of the country. The factory has encountered the usual obstacle incident to the introduction of manufacturing enterprises in California. There have been two or three strikes among the workmen concerning wages, but everything is now running smoothly. The factory made about 100,000 kegs in 1883, and 129,332 in 1884. At the close of 1884 the factory held a stock of 21,561 kegs. The managers expect to make 200,000 kegs in 1885, and claim that the factory has a capacity for 300,000 kegs. Despite this outlook from the local factory standpoint, it is probable that at least 100,000 kegs will be received at San Francisco from the East this year.

Steel Nails.

We understand that the Oakland factory has recently added a line of French wire nail machines, and is now prepared to turn out all kinds and sizes of this description. The demand for wire nails has become quite prominent in the last three years, and we are glad that they are now made here. They are largely used by sash, door, furniture and organ manufacturers, picture-frame makers, car-builders, and house and office furnishers. They are quite stiff and can be driven into hard wood without the nee of a brad-awl. They number more to the pound, and are therefore considered cheaper than other sorts.

The Pacific Iron and Nail Company undertakes to make every nail known to commerce. The enterprising gentlemen who started this industry on our shores deserve well of their fellow-citizens, and it is a pleasure to know that their efforts have been appreciated. The wonder now is that a nail factory was not started here ten years earlier. It meets a long-felt want of this city and Coast.

Steel Nails.

Within the past two years some of the Eastern factories have been making steel nails and tacks with more or less success, but whether steel will run out iron in this line of manufactures remains to be seen. It is to be regretted, says the *California Architect*, that some of the iron nails sold in this market in the past year have been of very poor quality. We do not know where they were made, but have seen them bend and break rather than enter the wood in which they were being driven by those accustomed to the use of hammers. A poor nail is about the most provoking thing in existence, and there is no excuse for their manufacture. We have heard no complaint concerning the product of the Pacific Iron and Nail Company, and it is fair to presume that the poor nails have come from abroad.

Late advices received from manufacturers of nails indicate that the demand for steel nails is so much greater than for iron nails that quite a number of nail manufacturers are abandoning iron nails and making only steel nails. This statement does not apply simply to those who have steel plants connected with their works, that is, to the Bellairs and Riverside. In the Wheeling district, for example, the Jefferson Iron Works and the Junction Iron Company have definitely abandoned the manufacture of iron nails, and will henceforth make only steel nails. At Wheeling all the mills are making steel nails to a greater or less extent, and most of them have practically abandoned the manufacture of iron nails. This grows out of the fact that the demand for steel nails is so much greater than that for iron nails that their iron nails remain untouched in the warehouses, while the steel nails in most cases are sent out as fast as made. Some jobbers still ask for iron nails, and when they do are furnished them, but the great majority only ask for steel nails.

Progress in Iron Founding

The art of producing iron from its ores, and of remelting the iron to forms, has always been of an experimental character, owing to the lack of certainty as to its component parts and their proportions. Irons themselves differ in composition so greatly that it is one of the most exactive of arts to produce an unvarying grade for certain and demanded purposes; and the ores vary so much in the same mines that those coming under the same generic, and even specific, terms are not always analogous. As an instance the Black Band ore mined at Mineral Ridge, Trumbull County, Ohio, is of one character when found under the sixth coal level, and of an entirely different character when appearing as an outcrop near the surface, where it is scarcely better than "kidney" ore or the ordinary "shell" ore, both of them too much oxidized of much value in the mechanic arts, except as makeweights. In fine castings, especially those of light weight, there is wasted usually about 700 pounds out of a ton of castings. It is evident that the intelligent selection of irons and fuels, and especially the determination of the character of ores by analysis or experiment, ought to reduce the present uncertainty of product and insure a result in accordance with the foundryman's design. This has been the endeavor of Mr. J. B. Renshaw, of Hartford, Conn., who has made a study of ores, their fluxes, the resultant iron, and the after-casting his business for several years. At length it is said that he has succeeded in putting the work of the foundry on a basis that removes it altogether from the line of speculation and experiment, and relegates it to one of the exact arts. His results from his studies are accepted in practice by a large number of manufacturers who make their own castings, and also by the managers of a number of blast-furnaces who reduce iron ores for castings and for the puddling furnace. These results are only a portion of the outcome of several years of experiments and investigations; the most important parts are those which determine for the practical foundryman the sorts of iron he should use to produce his desired result, and the proportion of the different irons.

INFLUENCE OF ANNEALING UPON THE MOLECULAR STRUCTURE OF IRON AND STEEL.—The magnetic balance shows that annealing not only produces softness in iron, and consequent molecular freedom, but it entirely frees it from all strains previously introduced by drawing or hammering. Thus a bar of iron drawn or hammered has a peculiar structure, say a fibrous one, which gives a greater mechanical strength in one direction than another. This bar, if thoroughly annealed at high temperatures, becomes homogeneous in all directions, and has no longer even traces of previous strains, provided that there has been no actual mechanical separation into a distinct series of fibers.

The highest degree of softness in any variety of iron or steel is that obtained by a rapid heating to the highest temperature less than fusion, followed by cooling in a medium incapable of changing its chemical composition. The time required for gradual cooling varies directly as the amount of carbon in alloy. Thus in absolutely pure iron rapid cooling, as in tempering, would not harden it, while steel might require several hours or days, even for pieces only 1 mm. in diameter. Slow cooling has no injurious effect upon iron when cooled in a neutral field; consequently, where time is no object, we may employ slow cooling in every case. A wire or piece of iron thoroughly annealed must not be bent, stretched, hammered or filed; the hardening effect of a bend is most remarkable, and the mere cleaning of the surface by sandpaper hardens that surface by several degrees on the scale.

GIANT PULLEY.—A grooved fly-wheel of remarkable size and weight is in course of manufacture by Messrs. Goodfellow and Matthews, of Hyde, England. The diameter is 34 feet and the weight 83 tons, while the circumferential velocity will be 5,350 feet, or over a mile a minute. The face is grooved for 32 ropes, each 1¾ inches in diameter, and capable of driving 40 horse-power. The fly-wheel is intended for the factory of the Ashley Mills Company, near Hyde Junction, and is made in 50 pieces.

SCIENTIFIC PROGRESS.

Man in Geological Eras.

The laws of nature are immutable. Cause and effect are inseparable. No particle of matter is exempt from them. Then, to examine and comprehend all the forms, conditions and properties of our material surroundings, though as easy as talking prose, is called scientific research, and the knowledge thus gained is called science.

One of the most superficial or recent formations are the Danish peat-mosses, which vary from ten to thirty feet in thickness. "In this," Lyell says, "at various depths are found the trunks of trees, especially the Scotch fir (*Pinus sylvestris*), as much as three feet in diameter. This tree is not now, and has not in the range of history been, a native of this island (England), and will not grow here now when transplanted. But it grew here within the human period, for Steinstrup found, and removed with his own hands, a flint instrument from beneath the trunk of one of those pines." The Scotch fir-tree, now extinct in that region, was followed by several species of oak (*quercus*) appearing successively at higher levels in the peat, and these in turn have been almost supplanted by the beech, which has been indigenous to that locality as far back in time as history extends. And yet, all the land and fresh-water shells, and all the mammalia found in Danish peat are of recent species. So we can begin to learn something of the age of a species.

The great antiquity of man is further attested by the chronological succession of materials used for making implements and by the rude character of the utensils. These periods are called successively the ages of stone, of bronze and of iron. The age of stone, as we have seen by the flint implement found under the trunk of the fir-tree, coincides with the period of the first vegetation in Denmark. The age of stone was succeeded by the age of bronze about the time the fir-tree was supplanted by the oak in that region. These two ages passed and were succeeded by the iron age and the beech-tree before history began. Flint implements were recently found near the Seine, in the vicinity of Paris, imbedded in gray diluvium, twenty feet below the surface. In the cavern of Arcy-sur-Yonne human bones have been found with the bones of extinct quadrupeds. Flint tools have been found imbedded with the bones of the rhinoceros and the hyena, 30 feet deep in gravel resting on the chalk at Abbeville, Amiens, and other points along the valley of the Somme. In a cave near Torquay, called Kent Hole, the bones of an extinct mammoth and flint tools of a very antique type were found mingled together in the stratum; above these were human remains, all in a matrix of red loam, and covered with stalagmite. In the Brixham limestone are caverns in which were found in a floor of stalagmite the humerus of the *Ursus spelæus* (cave bear), and still under it various flint implements; here, again, it is clear that man lived before the cave bear, which is now extinct. On the banks of the Meuse are the caverns of Engis and Engishial, both containing the bones of man and various extinct species of animals.

Many more evidences of the antiquity of man might be adduced, but already enough has been presented to show that he has outstripped most of the species of animals in the race of life that may have come into existence with him. Geology and archæology have taught us that man far antedates history, and was contemporary with many species of animals known only by their fossils. That he roamed along the banks of the Somme, Thames, Clyde, Rhine, Seine, Mississippi and the Po, and scattered stones rudely fabricated by his hands into utensils, as early as the pliocene period, and when the beds of those rivers were one hundred feet, and some of them one thousand feet, above their present level, there is no reasonable doubt.

The great and varying depth at which some tools have been found in the same locality shows that the stone period was ages in duration. Finally man became enlightened enough to work copper and tin into bronze, and this metal was used for making weapons at a time anterior to the founding of the Roman empire. Geologists calculate that it required thirty thousand years for the peat in the valley of the Somme to grow. Yet under this, and resting on the chalk, is a stratum of gravel containing stone implements. Fine canoes were found 20 feet deep under one of the principal streets of Glasgow; evidently that ancient city stands on ground which in pre-historic times was the bed of the Clyde. In the valley of the Nile a brick was found at a depth of 60 feet with the name of the Egyptian god, Amen Ra inscribed on it. Another brick was found in the delta which, according to Lyell, must have been burned 30,000 years ago.—*Phrenological Journal.*

COMPRESSIBILITY OF LIQUIDS.—From a paper recently presented to the Academy of Sciences of Berlin, by Mr. Quincke, it appears that the compressibility of liquids, which is generally considered to be practically *nil*, may be shown under pressures of even less than one additional atmosphere. Mr. Quincke experimented with liquids contained in glass bulbs, with a capillary tube attached to them vertically; the bulbs were placed in the chamber of an air-pump, and the decrease of volume resulting from increased pressure was observed, which method promised more exact indications than the opposite one of watching the expansion under diminished pressure. Water carefully freed from air by continuous boiling was compressed by 49 millionths of its original volume under a total pressure of two atmospheres. The following figures express the compressions of some liquids resulting from one millimeter additional pressure, also in millionths of the respective volumes: Glycerine, 0·03; olive-oil, 0·07; alcohol, 0·12. The observations, which extended over a large number of liquids, agreed well with one another of former, but not such extensive, researches by M. Grassi. Within the limits of pressure of one additional atmosphere the compression remains proportional to the pressure. The experiments further confirm the theory that a certain relation exists between compression and the coefficient of refraction, but as yet they are not decisive enough, whether one or the other of the various ratios, which have been based upon theoretical calculations, is correct.

How Rain is Produced.

The origin of rain is from the condensation of a portion of the vapor in the air which forms a mist or cloud. Generally this condensation proceeds slowly, and the clouds which result do not furnish rain. When this condensation takes place with sufficient rapidity, the small particles of mist increase in diameter by the condensation of more vapor, and forming drops of considerable size, descend to the earth in a shower of rain. Rain is the condensed vapor of the air, and this condensation can only be caused by cooling the air below the temperature of the dew point. This reduction of temperature may be effected by radiation, or by the contact of warm air with the cold surface of the ground, especially the surface of mountains, or by the mingling of warm air with colder air. These processes are so gradual, or limited in extent, they probably never result in anything more than a fog or cloud. To produce an abundant rain, the air must be suddenly cooled below the dew point, and there is no way in which this can be done so easily as by forcing it up to an elevation of one or two miles above the earth's surface. The temperature of the air sinks about 35 degrees in two miles of elevation. If air from the earth's surface be forced to this hight, a large portion of the vapor which is carried up with the air must be condensed. This may be caused by a mountain or mountain ranges, or from the opposition of two currents of air. The rainfall is uniformly greater on mountains of moderate elevation than it is at the level of the sea.

DRY FOGS.—In the United States dry fogs frequently occur in November, or the latter part of October. This period is commonly known as Indian summer, and is characterized by a hazy condition of the atmosphere, a redness of the sky, absence of rain, and a mild temperature. This results from a dry and stagnant state of atmosphere, during which period the air becomes filled with dust and smoke arising from numerous fires, by which its transparency is greatly impaired. This phenomenon is not peculiar to the United States, a similar condition of the atmosphere being frequently observed in Central Europe. These fogs have been ascribed to the presence of fine volcanic ashes in the air. In 1783 such a fog prevailed over all Europe, and continued for more than a month. It was preceded by a remarkable eruption of Mount Hecla, in Iceland, which for a long time emitted smoke of unusual density. In 1831 a similar fog prevailed in the United States, in Europe, and on the coast of Africa. It obscured the air to such an extent that the sun could be observed all day with the naked eye, without the interposition of any colored glass. At night the fog seemed decidedly phosphorescent, and emitted an appreciable amount of light, which could not be ascribed to the reflected light of the stars.

INDESTRUCTIBLE LIFE.—A matter of surprise and wonder to those who witness it for the first time is the rousing to life of whole colonies of infusoria by the addition of a drop of water to a few grains of earth or dust. These microscopic organisms abound everywhere in water containing decomposing vegetable or animal matter, and some forms may, in a dried state, remain for months or even years apparently dead, to be revived when water is again supplied to them. Jabez Hogg has been experimenting during the past three years with one form of infusorial life—the rotifers or wheel animalcules—and has even kept dried specimens for a time at a temperature of 200 degrees Fahrenheit, and afterward exposed them to intense cold, neither process killing them nor greatly diminishing their vital powers. Mr. Hogg supposes that as the animal dries it shuts itself up like a telescope, its skin taking an egg-like shape, and that a secreting organ coats the body with a gelatinous envelope which protects it from further change.

LUMINOUS AND HEAT RAYS.—Dr. Tyndall states that of the radiant energy set up by a gas flame only the 1-25 part is luminous; the hot products of combustion carry off at least four times as much energy as is radiated, so that not more than 1-100 part of the heat evolved in combustion is converted into light.

HELIUM.—Lava from Mount Vesuvius has given, while examined by Dr. Palmieri, the spectrum line of "helium"—an element which until that discovery was recognized only in the sun.

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:
Saturday Morning, May 16, 1885.

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Passing Events.

New placer diggings are reported in British Columbia near the river Skeena. Thers have been, however, so many false alarms about placers in that region that reports from there do not attract so much attention as formerly.

So far as can be learned nothing very startling has happened at the New River mines, the scene of the latest excitement. Many men have gone in there and more are on the way but no astonishing results have been announced as yet.

There seems to he quite a revival of the Cœur d'Alene fever this spring, and a good many men are going in there. It is stated that regular shipments of gold dust are being made in considerable quantities to the U. S. assay office at Helena from these mines.

The Paradise Valley Company, Nevada, is the latest one having trouble with the wages question. Superindendent McCurdy was paying miners four dollars per day, and did not want them to work for less, hut he thought that carmen and those working on the outside sorting and handling ore should work for less. This caused the trouble and the mine has temporarily closed down pending a settlement.

Denver capitalists propose moving a thirty-ton smelter plant to Nogales, Arizona, provided the mine-owners in that vicinity can furnish 30 tons of ore per month for reduction.

Moving Day.

From the midst of dust and disorder, and punctuated by the strokes of the carpenters' hammers, as they are giving finishing touches to our new editorial habitation, comes our May Day greeting to the readers of the PRESS. We began the moving of our printing and editorial departments before April closed, and now a week of May is gone and yet arrangements in our new location are hardly complete. It has proved a great task to move such an establishment as that of the SCIENTIFIC PRESS has grown to he, hut nearly all progressive movements call for sacrifices, and we have cheerfully endured the discomfort, and the publishers have cheerfully assumed the large expense hecause it was clearly to he seen that it would he to the advantage of our readers and patrone that the PRESS ehould share in the general movement toward Market street, which is indisputahly the hackhone of the metropolie of San Francisco. So here we are with our large power press, with its folding and etitching and mailing annexes, and with onr small army of printers and other attaches of the mechanical department, and last and least of all our editorial forces, massed in spacious apartments adjoining our husiness offices and patent department at 252 Market street, corner of Front street.

The concentration of their husiness under one roof has long been the design of Dewey & Co., hecause of the manifest advantage of close association hetween the different departments of literary and commercial enterprise which they have undertaken and promoted with success. The beuefits of the chauge will largely accrue to the friends and patrons of the establishment in hoth hetter and quicker work in the husiness and mechanical departments, and we trust that even the editors, feeling the inspiration of the new and more agreeahle arrangements and environment, will do their work with increased spirit and zeal.

The fitting up of the new establishment and the transfer of material and machinery has occasioned the publishere au unusual outlay. Such being the fact, we are disposed to ask that our subscribers encourage them in the effort by a general tossing in of what they owe. The amounts are small, and can prohably be as easily sent as not if attention is called to it. The aggregate would he considerahle, and would be very acceptahle just at this time.

A few hundred new subscribers would favor us more than usual at this time.

We shall be at home to callers in a few days, and shall be pleased to greet all old friends and as many new ones as interest in our work and the general advancement of the industrial growth of our commonwealth may prompt to come.

NEW MEXICAN CORRESPONDENCE.—The descriptive letters on Carlisle and Malone mining districts of Grant county, New Mexico, written hy our traveling representative, arrived too late for this week's issue. They will appear next week. These districts are attracting the attention of minere and mining men throughout the West and South. The letters will he of special interest to mining men and also to Eastern readers of the MINING AND SCIENTIFIC PRESS, as they contain much information on the methods of mining and ore treatments of these districts.

There are not a half-dozen idle msn in Silver Reef, Utah, who really desire work. If a man fails to find work with one or the other of the mining companies, there is no trouhle in finding ground on which to chloride—in fact there are many good miners here who would rather chloride than work for anyhody else. The Southern Utah *Times* saye there are less idle men in Silver Reef than in any camp on the Coast.

Several rich strikes are reported in the mines north-east of Butte, Montana. It is a rugged, mountainous country, and ledges can be traced on the surface for miles. Some great developments are expected to take place in this region the coming summer.

S. B. MOREY, a well-known mining operator ou this Coast, died at Fruitvale on the 11th inst. He was at one time superintendent of the Yellow Jacket mine, and has been engaged in mining operations for many years in this State and in Nevada.

Retorting Amalgam.

By the ordinary system of retorting amalgam the quicksilver is distilled hy heat only and the quicksilver fumes are forced out of the retort by their own pressure. The condensation is effected by a Liehig cooler. The disadvantages of this system are, first, that at the end of the retortiog the retort must remain filled with the quicksilver fumes; second, that it takes a high temperature and a long time to remove all the quicksilver from the hullion; third, the condensed quicksilver contains a large percentage of black slum, which is merely quicksilver in a finely divided state. Mr. C. A. Stetefeldt, the well-known metallurgist, formerly of this city, hut now a resident of New York, has devised a new system of retorting amalgam, which consists in forcing the quicksilver fumes out of the retort hy means of a steam blast, condensing eteam and quicksilver togcther, and conetantly circulating a stream of air through the retort and condenser. The effect is that at the end of each retorting no quicksilver fumes are left in the retort; the retorting is done at a lower temperature and in lcss time, and the condensed quicksilver does not coutain a trace of the black slum mentioned ahove.

To carry out this method of retorting a cast-iron retort of the usual form is set into a fire-place of the customary construction. The retort connects by means of a pipe with a condenser. This later ie a box made of hoiler iron, which is perforated hy numerous tubes like a tuhular boiler, or surface-condenser, in order to give the condenser a large cooling surface. The condenser is divided into numerous compartments hy partitions which have alteruate openings at top and hottom, one reaching from top nearly to hottom, and the next from hottom nearly to top.

At a suitable point in the pipe connecting the retort and condenser a steam hlast is introduced, which creates a vacuum or suction in the retort. In consequence of this suction the quicksilver fumes and air from the retort are rapidly drawn into the condenser. Here the quicksilver and steam from the steam blast, condensed in passiug up and down over and under the partitions and the air leaves the condenser through a pipe. This same pipe leads hack to the front or cover of the retort again; hence the same air which was originally in the retort and condenser keeps in constant circulation. The hase metals iu the amalgam, as soon as the retort gets red hot, absorb the oxygen of the air, and finally leave only a nitrogen atmosphere, hy which a possible oxidation of the quioksilver is prevented. The quicksilver and condensed water accumulate in the condenser, each one up to a certain level and then run out in a continuous stream through suitahle outlets which are provided.

The air-pump which carries the air from the condenser back to the retort is connected hy means of a T connection with another pipe. The object of this latter pipe is to equalize the pressure caused hy the expansion of the air inside of the retort at the heginning of the operation, and the falling off of quicksilver fumes in the retort at the end of the operation. The condsnser is surrounded hy a hox which is supplied with cold water, arranged so the cold water will circulate through the condenser tuhes, and the warm water run off.

The operation is as follows: The retort ie charged with amalgam and closed by the cover in the usual way; then the pipe connecting with the condenser is connected with the retort through an opening in the cover. The fire is started and as soon as the retort gets warm the steam hlast is turned on. As soon as the quicksilver commeuces to "run" the fire is kept very low, the distillation going on very rapidly. When the quicksilver runs light, the heat is increased. After the quicksilver ceases to run the steam blast is kept in operation for half an hour longer, in order to draw from the retort every trace of quicksilver fumes. The cover of the retort can then be removed without the slightest risk while the retort is still hot.

GLOWING accounts have been received for some time from Victoria, British Columhia, relative to the alleged richness of the mines on Lorne creek and the Skeena river, and now comes the statement that on Kilsam Kalem creek, ahout 40 miles from the mouth of the Skeena, diggings hav. been struck which prospect $4 to the pan.

Arizona and New Mexico.

Mines, Mills and Smelters.

[Notes from our Traveling Representative.]

THE Mimhres mill, near Georgetown, has started up.

HAGGIN & HURST ship their Victoria ores from Gague, N. M., to the Benson smelter.

THERE is a very quiet state of affairs in mining circles about Lake Valley and its honaoza mines.

THE Kelley mine, near Magdalena, N. M., is shipping all its ores to the Billiugs smelter, at Socorro.

THE Billings smelter at Socorro has heen running night and day since it hlew in, nearly two yeare ago.

THERE is a rumor that Chicago oapitalists have bought the Young Man mine at Malone, near Lordsburg.

MINING interests about Tucson are looking up somewhat, hut as yet are not pushing thiugs to their full capacity.

THE 30-ton smelter at Deming has been purchased hy partiee who intend buying and treating ores trihutary to that place.

SAILSBURY & WHITE'S emelter at Benson is only running one Water Jacket, improved pattern furnace. The capacity is 60 tons per day.

THE Tombstone Mine and Milling Company are not working a very large force of meu in their mines at present. Their mill at Charleston is runniog.

TEAMS that have been hauling coke from Wilcox to Globe for the smelters have been taken off. The copper company at Glohe has closed down for the present.

WORK on the Black Hawk mine in Grant county has been partially suspended. Ths closiog down of this property is a detriment to both husiness and mining interests of the district.

MINING men in Grant county are anxiously awaiting the completion of H. H. Carpenter reduction Works at Silver City. The succ.ss of these works will result in adding much to Grant county's output and lessening many dump piles now waiting a low-grade treatment.

THE Territorial Mining Company, at Dos Cabesos, are down 130 feet on a vein that shows six inches in width near the surface and eighteen inches at the hottom of ths shaft. The ore runs over $100 by sorting. Some talk of a mill in the near future is indulged in.

TOMBSTONE miners are now paid $3 per day. No difficulty is experienced in securing any numher of men at these wages. At present the supply exceeds the demand. Until work is further advanced and a few more companies start up miners in search of employment will do well to look elsewhere.

TOM EWING, of San Francisco, and Wilson Waddingham, of New York, visited Malone and Carlisle mining districts during the past week, their ohject heing to see and huy. As hoth are experienced mining men and represent a goodly amount of capital, there is a proha-hility that a sale or two may result from their visit.

THE Mammoth group, at Stanton, 60 miles from Tucson, in the Santa Catalina mountains are putting up a 30-stamp mill to be ready for work in 30 days. They will mill hy battery and plate amalgamation. Seventy-five men are now employed by this company. A numher of Michigan capitalists control the affairs of this property.

EASTERN men who fail to put up money to properly develop their mines and treat the output are making failures in every instance. Several mines in hoth Arizona and New Mexico have closed down recently on account of the timidity of investing stockholders, and trying to develop a mine with the expectation of dead work paying expenses.

COL. J. A. MUIR, superintendent of the S. P. R. R. at Tucson, has one of the finest collections of minerals in the South. The specimene embrace an extensive variety and are noticeable for their beauty and value. A glance at the cahinet of Col. Muir speaks volumes in behalf of hie popularity among mining men and his taste in the artistic display of so valuahle a collection. Thousands would not huy the cahinet, and when complete a more varied gathering of minerale cannot be found in any private cahinet on the Coast. Superintendent Muir is a Cali-

fornian, and his interest taken in mines and mining has pleased the many patrons of the Southern Pacific. All now lacking to complete the Colonel's collection is a cabinet in which to place this handsome lot of specimens. His many friends and admirers will no doubt supply this ere the gentleman is ready to use it.

RETURNS and shipments from the San Xavier district, 20 miles south of Tucson, are attracting attention. The ores are argentiferous galena and sand carbonates. Regular shipments to the Benson smelter have been made by a number of mines of late from this district. The San Xavier mine has over $100,000 of development work done. A recent strike exposed a large body of yellow carbonate ore running about $25 in silver and 42 per cent lead.

THE Grand Central mine at Tombstone is pushing the work of putting in the mammoth pump and expect to have it operating by July next. The cost of this improvement will be about $125,000. A raising capacity of 1,500,000 gallons per day is the work the pump will accomplish. The Grand Central is down 650 feet, with a three-compartment shaft. Water below the 600-foot level has stopped work until the big pump is in place. The ore output is 80 tons per day. The company's mill at Contention is running at full capacity. Over 200 men are employed by the Grand Central company.

DOS CABESOS mines are looking up prospectively, and the other way as to development and output. The Tornado Mining Company, of Cincinnati, Ohio, recently ordered a suspension of work on the mines and mill of the company. The ores are free-milling, but of a low grade, running from $8 to $20 per ton. They have a 10-stamp mill, battery and plate amalgamation. The erection of ten additional stamps is necessary to lessen the cost of treatment and enable the handling of the great body of low-grade ores profitable. It is feared that the Eastern management of the mine will not make the investment necessary to place the property on a paying basis. F. W. S.

Silver-Plated Amalgamating Plates.

For a number of years past, for saving gold in quartz and placer mining, the millmen on this Coast have preferred to use plates which have been prepared with a silver surface and very few plain copper plates are now used. As a consequence, the manufacture of silver-plated amalgamating plates has become quite an industry. Mr. Denniston, of the San Francisco Silver-Plating Works has filled not less than 3,000 orders for this kind of plate, and as showing how they accomplish the purpose he is enabled to give satisfactory references to all these purchasers.

The reputation of the establishment has been built up on the merits of the work produced. Full weight of silver has always been put on work of this description, and as they have all the latest and most improved methods for furnishing this class of work and skilled workmen to carry them out, the plates are known wherever any gold milling is carried on. They have been making these plates for the past seventeen years, and have sold them all over the Coast in every direction, and sent them to Alaska, Australia, Japan, Mexico and South America.

These plates have almost entirely displaced the old style, and give much better results. Labor in cleaning plates is saved and the quicksilver is enabled to perform its duty readily. In purchasing silver-plated amalgamating plates millmen should get good ones. It must be remembered that light silver plating looks as well as heavy, and therefore poor plates are sometimes sold by incompetent manufacturers, but they have no durability. Mr. Denniston prides himself in giving full weight of silver on all his plates, and as he has been in business here a great many years and still continues, his customers are evidently satisfied with his work. Full and complete instructions for handling these plates will be furnished on application. The largest plates of this kind ever made have been turned out at the San Francisco Plating Works, which is outfitted so as to make them of any desired size or form. Mr. Denniston has been awarded every first premium medal for silver plated amalgamating plates at the Mechanics' Institute Fairs for the last thirteen years.

The Calumet & Hecla mines, Lake Superior, produced last year 4,047,500 pounds of refined copper.

A Fifteen-Dollar Furnace.

Some time since W. Lawrence Austin, of Santa Barbara, Chihuahua, Mexico, read a paper on "Smelting Notes from Chihuahua," in which he briefly described a cupellation hearth commonly met with in the northern part of Mexico, called there *un caso*. Since writing the paper he has had occasion to construct a hearth of this description himself, using it, in conjunction with a water-jacket, for the reduction of a very refractory ore in the form of concentrates, and in a recent paper before the American Institute of Mining Engineers he qualifies some of the statements made in the paper referred to. At the same time, Mr. Austin presents some sketches which will enable any one to run up a similar furnace within three days, should occasion demand it.

As it is built entirely of common clay (the more refractory the better) and the ashes of scrub-oak taken from the ash-pit of the furnace itself, the materials necessary for its construction are available anywhere. Even the grate-bars of the fire-place are made of adobes cut in two. There are, scattered over the West, small deposits of refractory lead-silver ores, which, because of their rebellious nature or the isolation of the locality, do not admit of the ordinary smelting process and are not amenable to amalgamation or any other system of reduction commonly practiced; yet, with the help of litharge, or, in other words, by performing a crucible assay on a large scale, these ores can be readily and cheaply beneficiated, even where iron and coke are unattainable.

Mr. Austin says he is at the present time engaged in an operation of this description and is producing fine silver from a mixture of galena, pyrites and blende, using as fuel oak-charcoal, doing without the valuable fluxing ores attainable in most smelting camps, and depending wholy upon the litharge produced by the little adobe hearth about to be described. In doing this he is only imitating the common Mexican practice which has been in use for a century or more. Mr. Austin says:

In building the furnace which is the subject of the accompanying sketch I made use of labor and materials as follows, which gives cost of constructing one furnace:

300 adobes @ $ .01	$3.00
40 gals. clay, 80 gals. ashes, for test	—
One builder four days, at $1.20	4.80
Two helpers four days, at $ .60	4.80
Two boys four days, at $ .30	2.40
Total	$15.00

By comparison with my former figures these will be found somewhat in excess, a fact which arises from two causes. First, the inaccuracy of the statements upon which my calculations were based, and secondly the fact that the natives of Mexico, from one of whom I obtained the figures referred to, are, in their own country, always able to get work done more cheaply than a stranger can. This fact, by the way, it is well to bear in mind when forming estimates in that country, since the cheap operations of small proprietors often allure the inexperienced to commit grave errors of judgment. It will only be in rare instances that the profits of native proprietors can be augmented by handling large amounts of their ore with American machinery.

The Mexican is a good miner and a better metallurgist. It is well to examine closely the property he offers for sale, especially when it has a fine record and still cannot yield him sufficient for his simple wants.

But to return to our *caso*, the difference between the figures given above and those of my former paper is so slight as not to merit comment were it not for the lesson it conveys.

Lead ore, even when poor in silver, is very desirable in silver-lead smelting operations, and is sometimes paid for beyond its value. Again, the shipment of silver bars may, under certain conditions, be preferable to handling lead bullion. When a cupellation hearth can be put up, a cheap lead flux provided and the advantages of the former method of shipment tested without incurring serious expense, it might, in some cases, be worth a trial. The Mexican *caso* requires no expense for castings, no exhorbitant freight charges on the material for its construction, in fact it is simplicity itself, and answers very well for an experiment or where limited amounts of material are handled. In firing up care is necessary not to crack the test, but heat can be applied immediately after tamping in. Eighteen hours later the furnace is hot and ready for charging. Should the test be defective or worn out, chisel off the surface for six or eight inches, tamp it in again and the furnace is ready for firing. In putting in the the test the whole amount of material (clay four parts and ashes eight parts by measure), after being thoroughly mixed and dampened so as to retain the form of the hand when pressed, is thrown in together and tamped solid with wooden poles five feet long and three inches in diameter, sharpened at one end to a point one and one-fourth inches square. The reason for putting the whole amount of material in at once is that by this means the whole is beaten into a compact mass, whereas by tamping in a little at a time thin layers are formed, which easily peel off. After the whole is thoroughly pounded in the test is cut out with a piece of hoop-iron. The accompanying diagrams, exhibiting cross-sections and plan of the furnace, are self-explanatory. The adobes, or sun-dried bricks used, are 18x9x4 inches, excepting those forming the roof of the canal leading from the fire-place and covering the test, which are 26x11x3½ inches. Extra care is necessary in this preparation, and they are dried in the shade to avoid sun-cracks. The capacity of a furnace of this description is something over one ton of lead bullion in twenty-four hours, consuming less than half a cord of wood and requiring the attendance of four men, two on a shift, whose collective wages amount to about $2.80 per ton.

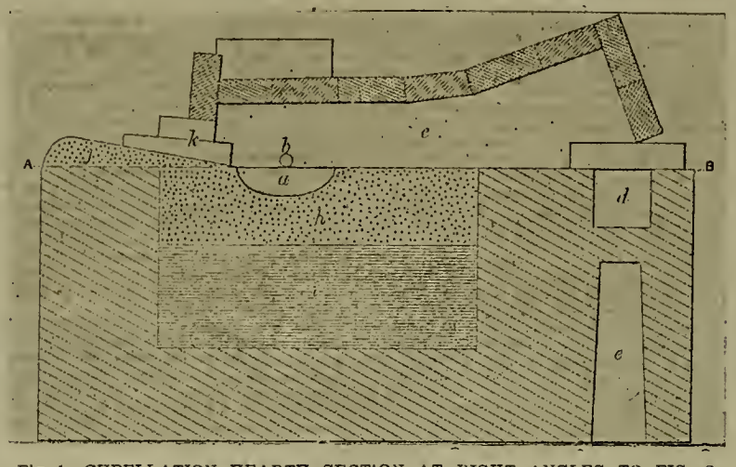

Fig. 1.—CUPELLATION HEARTH—SECTION AT RIGHT ANGLES TO FIG. 2.

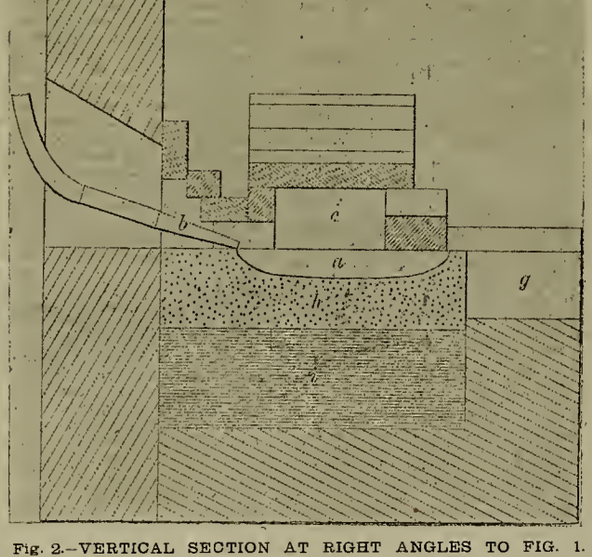

Fig. 2.—VERTICAL SECTION AT RIGHT ANGLES TO FIG. 1.

We have, therefore, in this apparatus, a $15-furnace, built in three days, capable of reducing one ton of bullion to almost pure silver in 24 hours, at a cost of $6.30 per ton. The operation of the furnace is very simple. The bullion is placed on the inclined hearth at *k*, where the flame passing over the molten metal strikes and gradually melts it down. Blast is not put on until the test, which holds 300 pounds of lead, is filled, when its strength is so gauged as to cause slight ripples to play over the surface of the bath. The litharge is drawn off as it accumulates into a basin outside the furnace, where it solidifies and is lifted off in cakes. It is noticeable that no stack exists, yet the flame shoots fiercely out over the metal whenever a stick of wood is laid in the fireplace. Repairs on the test, made necessary by the corroding properties of the litharge, are attended to when the silver is taken out. An old test pounded up finely and mixed with wood-ashes furnishes the material for making such repairs. The silver is allowed to cool gradually in the furnace, and, when solid, is removed, and the cake is thrown into water.

Electric Amalgam.

A short time since reference was made in the PRESS to an "electric amalgam," for use in the beneficiation of ores. The mercury was apparently charged with electricity in such a manner that, when used, it was kept in an active state and very "lively," which is a great advantage in amalgamating. This seemed like storage of electricity in mercury; but whatever it was, there is no doubt that a small piece of the prepared amalgam, dipped into a quantity of mercury, set the whole into a very active state, which could continue several hours.

Dr. J. H. Rae, who came to this Coast recently, while engaged in manufacturing the amalgam in this city, has discovered that he need not make a hard amalgam, but that he can prepare the mercury so as to answer the same purpose. By suitable manipulation and passing a current from a dynamo machine through it, the mercury becomes charged, and is able apparently to retain the current for some time.

A few pounds of this prepared mercury placed in a vessel and covered with brine was properly connected with a small electric bell, and there was energy enough in the mercury to keep the bell ringing constantly for 24 hours. Another portion was connected with a galvanometer, and even after 24 hours the needle would be deflected when both poles were connected. Dr. Rae is making the electric amalgam at the California Electric Works, 35 Market street, and will show the results to any one wishing to see them. Further experiments are being made, and when concluded we shall refer to the subject again. All who have used this amalgam have ordered second and third lots, which is the best sort of recommendation as to its efficiency.

New Reduction Works.

The Process at the Paradise Valley Mill.

Last November the Paradise Valley Mill and Mining Company's quartz-mill, on Martin creek, was burned to the ground. The Superintendent, J. V. McCurdy, who had, as if by magic, in a few months transformed the Paradise mine from an assessment to a dividend-paying mine, was in California at the time of the destruction of the mill. Being a practical and an experienced millman, he looked about to see if any improvement had been made in the method of reducing ore in the last quarter of a century. He became satisfied that there had, and he decided to erect concentrating works on the site of the burned mill. A representative of the Silver State recently visited the

New Reduction Works.

These works are situated on Martin creek, about seven miles from the town of Paradise and six and three-quarter miles from the company's mines at Spring City. The mill is erected on a steep hill-side, the main building being 40x100 feet in size, with two wings, one of which is an engine-room 38x40 and the other a drying kiln, 28x38. The ore is dumped from the wagons at the upper end of the mill and run through an 8x10 Blake rock-breaker, which reduces the hardest quartz to small pieces. It then passes between Cornish rolls, with 24-inch shells, which reduces the lumps of quartz to a smaller size and discharges into a hopper which supplies the pulverized ore to the three Huntington crushers, which are capable of reducing ten tons each per day. From the crushers the ore passes through Nos. 7 and 8 punched screens, or 45 wire mesh. From these crushers the ore is fed automatically to six Triumph concentrators of a capacity of five tons each per day, though where the ore is unusually heavy with sulphurets less than that quantity is concentrated. The quartz or gangue is carried by sluices to a tailings reservoir and the sulphurets are deposited in a bin, whence they are taken to a

Drying Kiln,

which consists of a revolving cylinder with six lifters. In the kiln the concentrations pass through screens, which prevents them from caking while drying. The kiln has a capacity of five tons per day, and it discharges into a hopper, from which the concentrations are drawn off into sacks for shipment.

The Motive Power.

The works are run by water-power, though a boiler and engine are being put in place in the building, to be used in the event of a scarcity of water or breakage of the water-wheel. The water is conveyed by a ditch about a mile in length from Martin creek to the mill. The dam is 70 feet long, 20 feet wide and faced with a four-foot wall of stone laid in cement. A short distance above the dam the water from two hot springs flows into the creek and raises the temperature of the water, so that no ice forms in the ditch or tail-race in the coldest weather. The power is furnished by a Leffel turbine wheel, 13¾ inches in diameter, with 51 feet head of water.

The Result.

Though some changes suggested by experience will be made in the new mill, the result so far is satisfactory and the success of the crushers and the concentrators is practically demonstrated. A crusher of 10 tons capacity, through a 40-mesh screen, requires no more power to run it than one and a half 900-pound stamps. The ore is worked up to an average of 80 per cent of its assayed value, while by the old amalgamating process it did not work over 60 per cent of its assayed value, and besides, the cost of reduction is greatly reduced. The pulp assays of the ore now being worked rangs from $40 to $60 per ton, and the tailings average about $11 per ton. The ore when concentrated assays about $650 per ton, and it is shipped to Salt Lake and sold. At present the works produce about 3,000 pounds of concentrations per day, and their capacity is to be increased by the addition of three more concentrators, and pans and settlers for working tailings, of which there are several thousand tons from the old mill on hand.

Other Matters.

The ore is hauled to the mill by ox-teams, which are found to be less expensive than horses. The company own nine quartz wagons and three sage-brush wagons. The wagons weigh from 4,000 to 7,100 pounds each, and carry from 12,000 to 24,000 pounds of ore. Every load arriving at the mill is weighed on Fairbank's scales, and at present there are 800 tons of $50 ore at the mill, besides some 700 tons of blanket washings, which average $70 per ton. Sage-brush is used in the drying kiln only as there is sufficient water-power to run the machinery. Near the mill are stables for the oxen, where everything is systematically arranged, and where, as at the mill, order prevails. Superintendent McCurdy and his family reside on the creek below the mill.—*Silver State.*

WHAT has become of the New River road project? Is it "teat?" It was understood that Col. Crossman would have a survey of one or more routes perfected before this date, but we cannot learn that anything has been done in that direction. If our citizens had not taken so active an interest in the matter we should be quiet. Perhaps the ground is too dry to make road now.—*Eureka Times-Telephone.*

Wood River.

A correspondent of the Virginia *Enterprise* says: Thinking that a description of this country would interest many who have an idea of locating in this neighborhood, I will endeavor to describe some of its good and bad points to the best of my ability.

Wood River contains four towns, situated within a radius of 12 miles; namely: Bellevue, Hailey, Ketchum and Bullion. Bellevue has a population of about 1,000 inhabitants. The principal industries are farming and mining. It is situated in a valley, and is a very pretty summer resort, the surrounding hills being all covered with grass four feet high, and is splendid for stock. The principal mines are the Queen of the Hills and the Minnie Moore, the Queen of the Hills employing about 70 men, and the Minnie Moore 40, and are good bullion producers. The ores extracted contain galena and silver. The Queen has a ledge containing seven feet of ore, and the Minnie four feet. The ore is put through a process of concentration called jigging, and then shipped to Salt Lake City for reduction, by rail.

Hailey is the county seat for Alturas county and contains about 1,200 inhabitants. It depends chiefly on the surrounding mines and farms for support. It contains many fine business houses and private dwellings, and is the central depot for the surrounding towns, mining camps and farmers. It is situated four miles from Bellevue and eight miles from Ketchum.

Ketchum contains a population of 1,000 inhabitants, and mining is the chief industry. The Parker is the principal mine and employs 70 men. There are a great number of prospects around Ketchum and some of them are doing well. Bullion is situated seven miles from Hailey and contains a population of about 400. There is quite a number of bullion-producing mines around Bullion. The principal ones are the Bullion, Ophir, Mayflower, Idaboan and Jay Gould, and I have no doubt but what this will be a big camp some day in the near future. There are a great many old Comstockers in this country, and they all seem to be doing well, but if they should turn out a bonanza on the Comstock it is more than probable that they would turn their faces that way again. It is quite dull here at present, but things are beginning to look better, but I would not advise any one to come here to look for work for a while, as the mines are full-handed and there are many idle men to be seen on the streets.

The Wood River Branch Railroad connects with the Oregon Short Line at Shoshone, and brings many emigrants to this country. They make a trip daily to Ketchum and return, and judging from the number of freight cars they are doing a good business. There is plenty of timber within a few miles of here, and lumber sells at $15 per thousand. Staple articles are also cheap. Potatoes one and a half cents per pound, flour $3 per 100 pounds, and everything in proportion.

Look Out for the Mining Interests First.

In the following letter to the editor of the Helena (Montana) *Independent*, a correspondent offers a suggestion which is applicable in other places as well: Of late I have seen several articles in the *Herald* in reference to paving our streets, the probable cost of it, etc. While a paved street might be a nice thing to have, we are inclined to think it is a little ahead of the times. My idea is that if the city can raise money enough for paving purposes, that they had much better take the money and take steps toward building a smelter or reduction works, something that is much more needed at present than paving our streets.

If we don't begin very soon to look more to our mining interests and less to something that can very well be gotten along without, what will become of us? Let your mining interests go? What use will a paved street be, unless it would be to keep the grass from growing in our streets. A smelter or reduction works in the vicinity of Helena would be a big thing. It would scatter many a dollar among us that a street pavement wouldn't. Just think of it, the amount of business there would be for a smelter or reduction works. There is the Ten Mile district alone would make it pay besides the new Helena district, Scratch Gravel, Mt. Helena, Last Chance, Stemple and a large number of other important districts. Why, one smelter or works couldn't begin to do the business.

The *Herald* is too much for style and not enough for good solid industry, something that is needed in any mining country. Now do let up on the pavement racket and give us something that will tend more to building up our city. After we have smelters, etc., then there will be plenty of time, and our citizens will be by far more able to build your pavements. The mines are what want looking after now.

DIANA MILL.—Jack Millner has been running the old Diana mill at Benton for the past three weeks, and is not yet through. We are told that the ore works up to about $1,000 a ton; also, that by means of suitable slum-pumps, all the water and slums carrying minerals in solution are pumped back for further manipulation, so that scarcely anything of value is lost.—*Inyo Register.*

On the Formation of Coal.

A correspondent of the *Coal Trade Journal* says: Among the coal-producing sections of Pennsylvania we find the strata of coal horizontal in sections west of the Allegheny mountains, and eminent geologists have pointed out that they were the most Bituminous; as we travel to the south-eastward, however, these same seams became progressively debituminized in proportion as the rocks become more bent and distorted.

Right here is where there seems to be a slight divergence from the rules governing the two sciences of chemistry and geology, for at first on the Ohio river the proportion—as determined by actual tests—of hydrogen, oxygen, and other volatile matters represented in these coals, ranges from 40 to 50 per cent, while eastward of this line, on the Monongahela, for instance, it still approaches 40 per cent, but careful measurements prove conclusively that the strata begins to experience some gentle flexures. Again on entering the Allegheny mountains, where the distinct and marked anticlinal axes begin to manifest themselves, but before these dislocations are very marked and apparent, the volatile matter is generally in the proportion of from 18 to 20½ per cent, so the teachings of advanced geology are not so inconsistent with those of modern chemistry as first appearances would indicate. So when we arrive at some insulated coal field, associated with some of the boldest flexures of the Appalachian chain, where the strata has been actually turned over, as it is near Pottsville, we find the coal to contain only six per cent of these volatile matters, consequently is entitled to being classified as Anthracits.

Thus, some gigantic upheaval, constantly appearing wherever valuable deposits are found, leaves us sadly at sea when we attempt to prove the presence or absence of matter by the principles we have been taught to recognize as responsible for the same, when in reality some force or combined forces of nature have transposed this entire strata of entire sections, perhaps entire continents.

As we examine closely into all coal deposits we find bands and nodules of what is called clay-ironstone, formed of carbonats of iron mingled with earthy matters resembling that which constitutes shale, this union seems to be purely a mechanical one, and what are termed chemical combinations and affinities have acted no part in their formation. Mr. Hunt instituted a series of experiments for the purpose of fully illustrating the production of this substance, and claimed that decomposing vegetable matter, such as would naturally be distributed through all coal strata, prevented the further oxidation of the proto-salts of iron and converted other peroxide into protoxide by taking a portion of its oxygen to form carbonic acid, such carbonic acid meeting with the protoxide of iron in solution, would unite with it and form a carbonate of iron; and this mingling with fine mud, when the excess of carbonic acid was removed, might form beds or nodules of this argillaceous ironstone; though this theory was not received by practical geologists generally when Dr. Hunt first advanced his views, it is now pretty generally admitted as the correct one.

Again we have found in the coal deposits of all sections of both America and Europe, wherever we have conducted experiments, the association of fresh brackish water and marine strata with coal seams of terrestrial origin, this is of quite frequent occurrence here. Thus some deposits in Pennsylvania, in all probability formed in brackish water, have often been described in the technical journals, and are generally the youngest members of the coal measures of any district, and at a point where they are in contact with the Permian group. It generally consists of shale and sandstone of variable thickness, with coal and traces of plants, including a bed of limestone from two to twenty feet in thickness, which is cellular, and resembles the lacustrine limestone of France and Germany. One place in Alabama it has been traced for miles, and can be easily recognized at points far distant even in the partially developed coal fields of Indiana.

THE MINER.—Hon. M. J. Farrell, of Austin, has been contributing a series of interesting papers to the *Enterprise* upon the silver question, and at their conclusion offers the following panegyric to the miner: He is a pioneer of the world. He braves all risks and dangers and opens up the wilderness for the more timid. He occupies the waste places of the earth, which but for him would never benefit mankind. He endures hardships, dangers and privations, and after wearing out his life for the benefit of mankind generally dies poor. Unlike that of the farmer and manufacturer, his contribution to the world is practically imperishable, and the dollar that comes from his hand is not that transferred from one to another of the money already existing, but is a dollar wrested from the bowels of the earth and added to the world's treasure. He sends forth from the barren fastnesses of nature a stream of wealth that flows through all the channels of trade and commerce, imparting life and vigor to the business of the world, and giving bread to earth's toilers to its remotest confines.

Owing to the fame as an ore-producer of the Copper Queen, of Arizona, the name has become a favorite and many new "Copper Queens" have resulted.

The "Overland Monthly."

This favorite magazine, the only one of the kind published on the Pacific Coast, continues to improve and furnish its readers with a varied literary feast each month. The table of contents of the May number is as follows: "Rambles in the Rockies," by Edwards Roberts; "Mrs. Jones and her Old Man," M. A. Ross; "Bergamo," W. Winthrop; "The Priest's Tale," Lonise P. Heaven; "A Ramble in the Foothills," Dagmar Mariager; "Little Jethro," Sara D. Halsted; "Riverside London," Samuel J. Rea; "Barbara's Story," Katharine Royce; "In Memoriam," L. P. H.; "The Capture of Porto Prayo," W. H. P.; "Deaf-Mutes and Their Education," Douglas Tilden; "The Gold-handled Riding-whip," Alhin Putzker; "To a Young Man," E. L. Huggins; "The Essential Principle of Poetic Art," G. H. Howison; "Ballad of the North Wind," Alfred A. Wheeler; "Prehistoric America," "The Religious Aspect of Philosophy," Basnett's "Theory of the Sun," "Recent Biographies," "Etc.," and "Book Reviews."

In the "Etc.," in speaking of "Pacific literature," occurs the following paragraph:

But how about the special function of a Pacific magazine? As a Pacific writer should simply seek the best excellence of which he is capable, without worrying about being intensely Pacific, should the magazine seek the best excellence attainable, without reference to local quality? If it were the only medium of current literature to the readers of its Coast, yes. To do otherwise would be as absurd as to limit our public libraries to local subjects or the work of local authors. But the best work of Eastern writers comes abundantly to our community through other sources; the study of Eastern subjects is amply provided for otherwise. In its marked discrimination in favor of Pacific writers and Pacific subjects, therefore, the magazine accepts not so much the provincial position of a local paper, as a specialized function, something as a journal of science, or art, or history, or criticism does. If in some not impossible far future it should hold a *commanding* position in American literature, it should undoubtedly become cosmopolitan in its aims, taking all Anglo Saxondom for its province; but meanwhile it can never be to advantage to a journal to spend much effort in occupying any field it cannot command.

ENCOURAGE THE PROSPECTOR.—When prospectors from other portions of the State come into this county for the purpose of exploring and developing our mines they should not be annoyed by demands for poll and road taxes. It is fair to presume that these men pay such taxes in the counties where they reside, and that they are only temporarily among us. When a petty official with a view of making his percentage harasses them and threatens to seize their baggage and prospecting outfits for taxes, a natural prejudice will be aroused in the bosoms of the hardy miners, and they will give our mining field a wide berth. Even if they do not pay poll-taxes in other places, Shasta county can afford to lose the few dollars demanded of them. The prospector, though poor and sometimes ragged, is the forerunner of capital and enterprise. By his efforts new mines and sources of wealth are discovered and brought to the notice of men of means. Capital follows him and prosperity and a demand for labor ensue. Take the history of the last three months as an illustration of the benefits arising from the labors of the prospectors; see the number of men brought into the county and the thousands of dollars that have been expended for supplies, and what we have seen so far is only a fraction of what we will see in the future. By all means the prospector should have a chance, and nothing should be thrown in his way to hinder or discourage him. He is working not alone for himself, but for all of us, and through his efforts the county will grow rich and prosperous. —*Shasta Democrat.*

THE ALBION MINES.—The new mines near Albion, in Cassia county, Idaho, are coming to the front. The district is located four miles north-east of the little town of Albion, and about 200 locations have thus far been made. The first claim located, known as the Albion lode, and owned by Lucas & Wells, was struck late in the fall of 1884. No development was made during the fall and winter, but recent developments show it to be a well-defined lead, 14 feet wide, and traceable on the surface for about one mile. Assays from this claim run from 50 to 400 ounces in silver to the ton, with a small percentage of lead and a trace of gold, the average being, however, about 100 ounces and 14 per cent lead. The climate and altitude of this camp are such as will enable prospectors and miners to continue their operations the year through.

PROSPECTING.—Ben Bowen, the Buckskin Ranger, an old prospector well known here, returned last week from a prospecting trip to the Henry mountains. He has been out there the greater part of the time for three years past. He brought in some samples of very fine rock, which he claims to have taken from discoveries made by him while out there. He has had some assays made here which show a high percentage of silver. He says that his claims lie about sixty miles south of the White Canyon country, over which there has been wild excitement of late.—*Southern Utah Times.*

Bnilding Materials.

Building materials in the rough and their preparation coustitutes oue of the most important and growing branches of trade on tho Pacific Coast. First, we have the lumber product which, including the Puget Sound supply, is probably the most extensive on the continent, to say nothing of tho vaet unexplored timber tracts of Alaska.

Our northern neighbor, British Columbia, has a vast forestry of lumber, which is already being utilized to somo considerable extent, especially in the neighborhood of Burrard Inlet, where many cargoes are annually furnished for exportation.

During the past few years English capitalists have been largely attracted to points on the Pacific Coast other than those of British Columbia, in pursuit of valuable timber lands. They have also succeeded in securing some considerable investments—notable among which is the California Redwood Company. This incorporation, which ie composed chiefly of British capitaliets, has secured many thousands of acres of redwood timber land iu Mendocino county, and in furtherance of their business plans, have erected wharves, etc., at Port Costa for storing their lumber preparatory to its shipment to England. They have already exported some ten or more cargoes of redwood lumber to Europe, and this branch of their business promises to be of steady growth.

Many American lumber companies are also largely engaged in exporting. While exports of lumber have been quite active during the past year, at the same time shipments of doors, windows, mouldings, etc., to the Australian colonies havo been large; while De Lesseps' Panama Canal has been and still is a large purchaser of lumber. New York drawe upon us for redwood shingles, while one or two cargoes of ship spars and redwood lumber have also been sent to the Atlantic States upon orders. Chile has also taken several cargoes. Low coasting lumber freights have been the rule during the year, and this of itself has been an inducement to outsiders to ship lumber to market, and in some cases they have heeu forced to sell their cargoes at a trifle more than enough to pay for freight and charges.

Business At and About Seattle.

The Seattle Lumher and Commercial Company, according to a local paper—the *Post Intelligence*?—furnishes employment for ahout 80 men, and is engaged in the manufacture of rough and dressed lumher, sash, door, lath and shelving. During the year they have made a great deal of trimmings for churchee around the Sound and vicinity. The cspacity of the mill is estimated at 50,000 feet per day.

The Stetson and Post mammoth mill employs 90 hands, and turns out a vast amount of material. The estimate of material made daily is as follows: 65,000 feet rough lumber, 25,000 laths, 100 doors and 100 windows. They have added new machinery and have improved their mill generally since 1883. One noticeahle improvement is the introduction of the steam feed, by which the carriage is driven to and fro. The Seattle Mill Company employs 20 hands and manufactures sash, doors and all kinds of rough and dressed lumber. The capacity of the mill ie ahout 30,000 feet. The Western Mill Company employs ahout 20 hands and makee all kinds of lumher, sash, door, etc. The Michigan Mill Company employs 15 men and makes rough and dressed lumher. Yesler Mill employs 65 men. This mill suppliee a great deal of the Puget Sound trade. It has a capacity of 30,000 feet per day. There have been several new machines added during the year. The Oregon Improvement Company's mill employs 22 men and makes sash, doors, etc., hesides the rough and dressed lumber used in constructing the company's improvements. There has heen added to the mill during the ycar a 50-foot hed planer.

The O. I. Company's new mill stands uncompleted, with much of the fine new machinery scattered on the floor. It has cost the company ahout $22,000 already, and unless the Puget Sound Shore Line finds a need for the site of the old mill, the new one will remain in its uncompleted condition. The Occidental mill stands all ready to hegin operations, but the property heing in litigation, the owners will undouhtedly be compelled to allow it to remain in idleness.

TONS OF GOLD COIN.—At the last session of Congress an appropriation of $100,000 was made for transporting a portion of the money in the vaults of the United States Sub-Treasury, in San Francisco, to the Treasury at Washington. Though no official notification of the time of removing the coin has heen puhliehed, it is helieved that the transfer will be made ehortly. The *Alta California* saye there will he on hand by the end of the present month at least $90,000,000, and if necessary all hut $5,000,000 can he withdrawn. Of this largc sum $50,000,000 is in gold coin. It weighs 83 tons and will require 8 cars to carry it. The heavy coet of transporting hy exprese companies arises from the fact that they have to give honds for safe keeping, and are ohliged to keep extra guards over it during the entire passage.

The Richmond mine and furnaces at Eureka have started up again, putting about 150 men at work. A gang of non-union men, at reduced wagee, is working in the mine.

USEFUL INFORMATION.

Painted Floors.

That carpeted floors aro harborers of disease is a queetion which, to thoso who have heen placed in position to fully investigate, has but one side; and since some of our leading jouruals have called to mind long arrays of unquestionablo authorities proving that carpets, however clean and free of dust apparently, give off at every step or movemcut infinitesimal germs of lung irritants, the pcoplo seem to have indorsed the theory, and in many a fine house carpets have given place to Eastern rugs which, occupying a central position, leave a fino opportunity for the paintcr to display his taste iu decorating the intervening space betwecu the rug and wainscoting. It will, however, place the work aud imperfections of the carpenter more prominently before the people, inasmuch as the floor, being constantly exposed, must he made smoother and of better lumber than often finde ite way into the floors of our houses, for when the floors were entirely covered with carpets, damp, unseasoned lumher or timber or the same affected with dry rot, could he used, and the occupants ho little the wiscr for the deception; but now the floors must he of good lumher and nicely fitted, else the painter, whose work supercedes that of the carpet-layer, will not accept the floor as the carpenter left it, for his work being on top, he will be held responsihle for its appearance forever afterward.

If this change in fsshion hrings ahout this revolution in floor-making, the change will have another argument in its favor; for others, as well as we, have seen damp, unseasoned lumber put in floore, which in turn were laid upon the joists of the same or even worse quality, and then a carpet covered over all. The poor inmates were thus compelled to hreathe the moisture of seasoning lumher after it was filtered through a carpet, which tended to render it still more unhealthy; and hence we are of the opinion that carpets are respousihle for far less disease than charged with; nevertheless, we are decidedly in favor of the rug system of covering floors, for the reason that it is much more economical. It is hygienically and otherwise a very wise plan, hesides the facility of often removing and thoroughly shaking the rugs, without employing a lot of workmen to take up, and heat and put down again. It looks as though carpets, like the Chinese of the Pacific Slope, "must go."—*The Manufacturer and Builder.*

CONCRETE WALKS.—An engineer tells how to make a cement or concrete walk requiring no great skill in preparing materials. These are water, lime aud gravel or ashes, or both. The gravel and ashes are put in a heap and wetted. One harrel of the waterlime is mixed with sharp, clean sand, dry, heing shoveled over hack and forth several times to get a thorough mixture. A portion is then mixed with water into a thin, soft mortar, and five parts of the wet gravel or ashes are well mixed with it, so that every fragment is coated with the comhining mortar. This is important for ohvious reasons. The concrete is spread on the graded walk and heaten down with a rammer until the moisture gathers on the surface; some of the dry sand or cement is then scattered over the surface to absorh the moisture, and the surface is smoothed over with a plank ruhher having a sloping handle to work it back and forth. In a few days this is hard, aud it becomes harder with time. By making divisions of thin strips of wood or tarred paper the cement may he laid down in blocks, squares or diamond-shaped, and for extra good walks the blocks may be colored hy mixing the finishing coat with brown or gray, or other colors, alternately.

LONG-TIME SECURITIES.—It is very common among railroad corporations to have leases executed for such a long term of yeare that perpetuity is practically secured. So accustomed have railroad managers thus hecome to the fixing of very long periods for their operations that it is not surprising to notice a tendency toward the greater extension of the limits in which their honded indehtedness will become due. The longest period of this kind which has yet come under our notice is the one proposed last week at a meeting of the stockholders of the Pittsburgh, Fort Wayne and Chicago Railway Company. It is proposed to issuc honds to he due at the option of the company after the year 2868, or only a little matter of 984 years hence. The time is coming—if, indeed, it has not already come—when bonds of this kind, repreeenting undouhted value, will he in very good demand by investors in thie country who desire to put their money where it will not he dieturhed every few yeare hy their securities heing paid off, caueing them much trouhle in seeking other investments.

PLACARD BENISONS.—We eometimee eee at the doorstep of some house the word "welcome" imhedded in the rock or ou a foot-mat. It ie pleasant to he so cordially and promptly invited within, but we must divide this gushing hospitality with the merest wayfarer, the peddler and the tramp. If it were thrown down just once and for us only, what a different train of thought it would suggest! But a hospitality eo hroad overlaps itself and losee its suhtle and most cherished fragrance, for the truth is, neither love, friendship nor religion can he profited hy tricks or rude puhlicity. Their graces and henedictions, their benisons and henefits, come with silence and secrecy.

THE ELECTRIC LIGHT AND GAS.—When the electric light was introduced the city of Boston was paying $2 per 1,000 feet for gas, and private consumers were paying $2.80. Now the city pays $1.30 snd private consumers $1.80. Boston has been a liberal patron of the electric light. Its streeta havo probably been lighted more hrilliantly for tho past two or three yeare than those of any other largo city. And the police department of Boston has borne testimony to the value of this extra lighting as tending to prevent crimo. But the gae has not hecu entirely crowded out of the streets, aud it is now proposed to light the city again with gss, on tho ground of its being more economical.

SOLDERS FOR ALUMINUM.—Aluminum may bo soldered by means of solders of tin and zinc, or of tin, bismuth and aluminum. Those of tin and aluminum are to be preferred. According to the working that the soldered piecce have to undergo the solders must have different compositions. If the metal is to be molded an alloy of 45 parts of tin and 10 parts of aluminum should he used, which is malleable enough to withstand the hammering. Pieces that are not to he further worked are easily soldered with an alloy of tin and a less quantity of aluminum. The process is the same as in soldering tin plate or it can be effected still hetter with the flame.

MAKING BUTTER BY ELECTRICITY.—A patent has heen taken out in France hy M. Tichenor for a process of butter-making hy electrieity. It is stated that, the milk being placed in a vessel of special form, a pair of electrodes is introduced and connected to a dynamo capahle of yielding a current of 40 volts, when in from three to five minutes the hutter accumulates at one end of the poles in the form of little halls. The claims incinde the removal of rancidity from hutter, and the manufacture of cheese, by the help of the current.

COFFEE-COLORED CURTAINS.—The easiest and most satisfactory way to dye them is, after washing, to use yellow ocher powder. A small quantity does for one pair of curtains, mixed firet with a little water, and then diluted according to the depth of ehade wanted. They shonld not be wrung, but just well pressed between the hands and carefully hung up to dry, and then mangled when thoroughly dry. By this process one procures a rich coffee tint, without anything disagreeahle.

SUGAR FROM CORN STALKS.—The helief of some persons that sugar in paying quantities can he got from corn stalks, as well as from sorghum, recalls the fact that the State of Connecticut gave to Edward Hinman a patent for making molasses from corn stalks, in October, 1717, or nearly 167 yeare ago.

TO MAKE A GLUE THAT WILL NOT BE AFFECTED BY MOISTURE.—Take of good common glue 2½ lhs., resin 2 lbs., and red ocher 1 lh., with a very little water. Glue melted in skimmed milk is also recommended—1 lb. of glue to 2 quarts of milk.

A BAVARIAN chemist is reported to have invented an enameling liquid which renders any species of stone or cement harder than granite, and gives it the indelihle appearance of any mineral that may he desired.

WIDOW PENSIONERS.—Twenty-one thousand widows of soldiers of the war of 1812 are stated to he still drawing pensions from the Government.

GETTING PARTICULAR.—Leeds, England, has a "society for the suppression of noisy trades in residential localities."

SILK to the value of $17,000,000 is produced annually hy the 60,000 people employed in that industry in Switzerland.

GOOD HEALTH.

The Babyhood of Cocaine.

I. Claihorne, Jr., writes to the *Herald of Health* as follows:

Since the invention of vaccination and the discovery of general anæsthesia as a consequence of the inhalation of chloroform and ether, no more wonderful and eimple secret hae been filched from nature'e healing stores than that revealed through the recent discovery of the local anæsthetic, cocaine. The discoverer, in the course of chemical experiments, accidentally noticed that an application of a two per cent solution of the muriate of cocaine to the eye rendered it ineensihle to contact with the finger. He was quick to realize the scientific importance of his discovery, which has eince heen fully established hy numherless experiments hoth in Europe and in thie country.

Cocaine is an alkaloid belonging to the same class of chemicale ae quinine, strychnine and atropine. It is ohtained from a small tree six or eight feet in hight, the leaves of which, when green, are said to resemhle those of the tea plant. It grows wild and is aleo cultivated in South America, chiefly in Peru and Bolivia. Its wonderfully stimulating properties had been recognized by the natives long before medical men had any knowledge of them. By chewing the leaves together with a little vegetahle ashes containing some alkali, the natives of these countriee are enabled to bear with ease the toils of long journeys in the heat of a tropical summer. In such high esteem was it held among these people that they called it the "Divine Plant." Its leaves, made into amulets, were secreted about the persons of the young and old as a talisman against evil spirits and disease. In 1569 the first medical treatise upon the plaut was written by a physician of Seville, and in 1749 it was first brought to Europe. Siuce the latter date it has steadily found favor with the scientific world, until in the fall of 1884 ecientific research culminated in discovering its anaesthetic properties when applied locally upon any of the mucons membranes of the human body. As the alkaloid itself, cocaine, is not freely soluhle in weter, its soluble salt, tho muriste of cocaine, has heen used, and is found to possess all the properties of the alkaloid.

The local anæsthetic effect of the drug has proved itself of incalculable value in enabling surgeons to perform the most delicate and otherwise torturing operations on the eye without infliction of pain. All the operations performed upon the eye, save those upon the lids, can now he done painlessly, without the neccssity of the patient's undergoing the general insensibility produced hy ether or chloroform.

The Safest Part of a Car.

It was well said by the conductor, who, when asked what was the safest part of a car, replied, "That part which happene to be in the shop at the time of the accident." It is a popular superstition that the center of the car is not only the safest part, but is also much the easiest riding. One of the greatest trials of a Pullman conductor's life is the fact that ahout every passenger aske for a lower center herth the first thing, and is frequently indignant becausc it caunot he had. If the center of a car rides any easier than the end, then our cars, huilt as solid and as strong as they are, spring up and down in the middle precisely as does a huckhoard. If they do not, why should it rise any easier? As for safetv, if you are in the rear of the last car on the train, and another train runs into the rear, you are liahle to get hurt. In all other accidente you can conjure up as liable to occur, it is the safest. If a head collision, there is nothing hack of you to add force to the hlow. If the car leaves the track and collides with a bridge or any ohstruction on a side track, it will not he in your end. If the train is thrown down an embankment there is nothing to land on top of you. Then, this location is the most pleasant. From it you can watch all the movements of your fellow passengers, often a good way of passing the hours of a long aud tedious journey. If your eye happens to catch a particularly fine view, you can, hy turning in your seat, or stepping to the door, take it all in. If there is a safest part of a train, it is in the last seat in the lsst car.

OVERWORK.—"To have as much work to do as one can do, and a little more," has been given as the hest recipe for cheerfulness and contentment; hut while readily concurring in the first part of the sentiment, we cannot hut suggest that it may be, perchance, that very "little more" which is at the root of half the ill-health, pale faces and fractious nerves of the present day. It is that last drop in the already full cup, that last straw on the already well-laden hack, which is too much—just one degree too much for the sorely-pressed men and women, who are fighting in the fight of life, and it is that overplus from which they ought if they can to ahstain. They will not see it; they will not do it. Each allows that in the case of another that other's duty in the matter is plain enough; hut for him or herself—and then follow excuses, arguments and ohstinacy not to he shaken. Everyhody, it would seem, must attempt something over and ahove what he or she can possihly accomplish; everyhody must drain a little more out of their worrying, feverish hrains, than can be yielded consistently with only wholesale effort and energy; everyhody must fly at game heyond their reach, if only it he within their sight.

A NEWARK, New Jersey lady has recently ohtained lettere patent for a spoon that may he used by iuvalids and children without spilling its contents. The improvement consists of an attachment to the cdge of the larger portion of the bowl of an ordinary spoon, and is highest opposite the handle and tapered each way toward the end of the spoon. The lip may he made outwardly similar in form to a section of an inverted spoon-howl. This spoon will prove of great convenience for those who have the care of children or pereons that are eick.

TO EXTRACT CITRIC ACID FROM LEMONS.—The juice of lemone is allowed to ferment, the chalk added to form calcium citrate. This salt when treated with sulphuric acid decompoeee, giving rise to calcium sulphate, a white insoluble powder and citric acid, which is in eolution. The latter ie then evaporated and the citric acid purified hy crystallization. It is in good demand and regularly sold by wholesale drug houses.

IMPURE MILK.—Of eeventy-five milk dealers, the contents of whose carts were inspected a few days eince in Brooklyn hy the Inspector, nearly all were found to contain large quantities of water, and eeven were disposing of impure milk.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA

Amador.

MILL.—Amador *Sentinel*, May 6: Work on the Shugert & Morgan mill in Hunt's gulch is being pushed as rapidly as possible. Considerable grading has been done on a point just below the tunnel, and here the work is in progress. The management decided to grade for a 40-stamp mill, but at present will only erect 20 and a building to cover the same. A large ore bin on the slope of the hill is about completed. The mortar blocks are up, and all the timbers belonging to the mill proper are on the ground, mortised and fitted for position. The mortar blocks and heavy framework are of Oregon pine, coming by way of San Francisco. The intention is to make the mill as complete as possible in point of compacity, and to this end self-feeders and improved concentrators will be put in, all the machinery to be run by water-power. A pipe to the ditch on Murphy's ridge will give about 450 feet pressure. We learned it was the intention to open up the Amador Queen near by and make that claim the real producer of ore, but likely running on quartz from the Murphy's gulch side. The claim will be run by machinery geared to a water-wheel. When the Amador Queen shaft was sunk several years ago, plenty of ore was shown up that prospected well. All ore raised can be run across a trestle to the mill, only a short distance. From present indications the mill will probably commence crushing ore during the summer months, starting on two quartz piles that are expected to pay handsomely.

HEAVY SALE OF MINING PROPERTY.—W. A. Nevills got back from the city on Sunday evening. As far as we can learn, he has sold to parties in Chicago one-half interest in all mining property in this section, embracing the Mammoth mines, Big Tunnel, Moore mine and Little Ranch. We have it on good authority that the price was $400,000; $250,000 cash, balance conditional in one year. Mr. Nevills still retains one-fourth interest in all the property. Senator S. P. Jones holds one-fourth, and the Chicago capitalists one-half. Work at the Big tunnel and also at the Mammoth mine and mill is proceeding as usual, under the management of Mr. Nevills. The appearance of a clerk is the only change at present.

GOVER.—Amador *Ledger*, May 9: Important discoveries have been made in this mine, near New Chicago, which encourage the stockholders to believe that a return of the days of dividends is not far off. In running a drift west, at a depth of 450 feet from the surface, a large body of quartz has been struck. The width of ledge we have not heard. The ore is said to be of paying grade, and futhurmore it is confidently claimed that it extends clear to the surface. The mill has been started to its full capacity of 20 stamps. A large force of men has been put to work, and everything betokens a long and successful career of activity for the mine. New Chicago is already feeling the stimulus of this new life; it now boasts of three boarding-houses.

MISCELLANEOUS.—The St. Julian claim at Middle Bar made a division of the proceeds during the past week, between the owners and lessees. The terms of the lease provide that the net proceeds, after paying all expenses, shall be divided equally between the contracting parties. The first division under this agreement was made last Tuesday. We understand that a snug little sum was divided among the owners, who are entirely satisfied with the results so far.

MAHONEY.—Amador *Dispatch*, May 9: We learn that arrangements have been made for starting up the Mahoney mine at Sutter Creek, in a short time, on a grand and substantial scale. The company now having control of the mine have an unlimited amount of capital and will be able to go ahead with the work without any financial drawbacks. Morris Brinn has been installed as general superintendent, and Humphrey Reese as underground foreman.

SUTTER CREEK.—Cor. Amador *Ledger*, May 9; The Iowa mill was started a few days ago. The mine is still yielding ore of high grade. Mr. Stewart is still running 20 stamps of the Lincoln mill, on the dump pile. At the McIntyre mine, the developments continue to be of a promising character. The Amador Sulphuret works are expected to resume operations in a few days.

SOUTH SPRING HILL.—The contract has been le for sinking the shaft 200 feet deeper. The price we are told is $8.50 per foot. The new hoisting works are running smoothly, and the mill is kept steadily at work.

Del Norte.

HANES FLAT.—Del Norte *Record*, May 6: Messrs. Yates and Morse, interested in the Hanes Flat mine in this county, went below on last steamer, and we are informed that their business there is to purchase the machinery for a little saw-mill to be erected on Coon creek. It is the intention to add the water from this creek to their former supply and bring the water to their claim by means of flume, thereby increasing the supply and obviating much expense in the way of repairing that from time to time becomes necessary.

Inyo.

THE MAXIM.—Inyo Co. *Register*, May 7: Wm. Stansfield, of the Maxim propeity on the river near old Cbrysopolis, has completed the work of putting in place and operation two new concentrators. A great deal of excavating was necessary to place them in correspondence with the tanks and tailings reservoir. The machines are the Duncan patent of 1883, entirely new to this part of the country. They are constructed wholly of iron, in general appearance, much like the well-known Hendy machine. The revolving tables have a peculiar oscillating motion which throws the water down through the center, while the heavier sulphurets fall into a lower rim from which they are discharged into tanks. Those best informed think that their great practical success will come when the mill gets to running on the vast quantities of low-grade gold ores with which the district so abounds. The mill will probably commence running day and night during the present week.

GAVILAN.—*Independent*, May 9: A crushing of 18 tons of ore from the Gavilan mine was made some days ago at the arastra at Hunter's canyon. This is the ledge belonging to Cohn & Straus that was discovered last fall. This ore yielded $43 per ton. The cost of mining was $4 per ton; packing the ore to the arastra, $6 per ton; crushings $10 per ton; total cost, $20 per ton, leaving a margin of $23 per ton. The ledge is four and a half to five feet wide, and stands up in the side of a deep canyon, exposing a large amount of ore.

COLUMBIA MINE.—The Columbia is one of the most promising mines of the Darwin district. Frank Silva is getting out ore the best of which will go 120 ounces per ton in silver and 70 per cent lead; this he is sorting for shipment. There is much ore in this mine that will go from 35 to 40 ounces in silver. The last shipment of bullion made by J. C. Eddy from Snow's canyon was of the value of $2,641. The bullion was of silver, 987 fine, and contained $72 in gold. Two or three times each month Mr. Eddy ships small lots of gold ranging from 12 to 30 ounces. Most of this comes from Old Coso district. Other parties at Darwin ship about as much more. Last Monday Billy Hedge brought down some samples of ore from the mine owned by himself, Dick Eldred and Dan Crough. The vein is found over the whole of their claim, and also over the claim of Welch and Dons adjoining. All of these parties are getting out ore right along. John Alexander came down from the While Hill mine last Wednesday. He says the mine continues to show up quite as well as at any former time.

LOOKOUT.—Start furnace on the 10th inst. Everything in and around the mine is looking well. Daily output of ore from South Lookout is six carloads. Have resumed sinking main winze, South Lookout; nine miners employed.

Mariposa.

DEVIL'S GULCH MINES.—Mariposa *Gazette*, May 9: Dr. W. N. Martin has come up to see his mining property situated about 12 miles east of town on Devil's gulch. During the past season the doctor has been to great expense in supplying the necessary machinery to work the heavy bank gravel mines by hydraulic process. About the time everything was in good working order and ready for action, instead of a rainy season as is customary, a season having no rain in it for mining purposes followed up most severely and still continues, hence the property, contrary to all expectations, has been idle and unproductive, all for the need of water. There is a large field of pay dirt and gravel in that section which has never been disturbed by the pick of the delving miner.

THE DILTZ BONANZA.—Captain Diltz was in this week and he informs us that the opening out of the quartz rock upon the face of the new shaft is most remarkable. The outlook of ore exceeds all expectations, for it covers space of 110 feet in width and indicates widening out as the shaft goes down. Captain Diltz is getting out timbers with a view to stoping rock from any portion of the mine desired. It seems almost useless to bring any more ore to the surface until one or two mills are built to get away with what ore is already in sight. Captain Diltz's mode of working the mine by washing away everything in sight through his enormous sluices, and piling up the profitable class of ore will probably be continued by him as long as he owns the mine.

THE BUENA VISTA.—This fine mining property which has about as much traditional history as most any mine in this section, is located but a short distance from the Diltz mine on or near Saxton's creek. Like many others of our best mines, it has had its ups and downs and has really never got into a well-settled groove of honest management whenever an attempt bas been made to work it. This Buena Vista mine has, we are assured, a fine character of ore already developed sufficient to guarantee its going ahead and producing its monthly quota of bullion as much so as most any other mine in this county. It has a new 10-stamp mill and as we are informed it would require but little outlay to set everything going as originally intended when the mill was built. The property has been in litigation for a year or two past and is now offered at Sheriff's sale.

Nevada.

PENNSYLVANIA MINE.—Grass Valley *Union*, May 6: Work on the Pennsylvania mine is progressing very favorably, and the prospects for its developing into a good mine is very flattering. The main incline is down 250 feet, and at that point crosscutting for the ledge is being done, and it is very probable that the ledge will be cut within a few days. On the 175 level some very good ore is being taken out, which shows well in free gold, rich sulphurets and galena. Work throughout the mine is being pushed with vigor, and as soon as there is room for more men they will immediatcly be put to work. There is no doubt but the Pennsylvania will be one of the paying mines of the district in the near future.

MINE PURCHASED.—Foothill *Tidings*, May 6: Last year a party of our citizens bonded the quartz ledge, now known as the Horse Shoe, from J. Mellow and partners and on Tuesday (yesterday), the present Horse Shoe Company purchased the property out and out. The Horse Shoe Company now own the adjoining ground (the Oakland) and it is their intention soon to erect a water-wheel and commence active operation in the way of developing the mine. The Horse Shoe ledge is all the way from six inches to 20 inches in thickness and the ore from it has averaged by mill process, $43 per load.

RICH ROCK FROM THE GREEN MOUNTAIN.—Sims & Co. yesterday had a clean-up at the Rocky Bar mill of nine loads of quartz from the Green Mountain claim which yielded $195.50 per load, without the sulphurets. The highest estimate placed upon the yield of the rock was not exceeding $80 to $90 per load, which would have been a fine yield. From indications the Green Mountain mine will become as noted as formerly for its rich product.

SOLD.—North San Juan *Times*, May 9: The Sweetland Creek Gold Mining Company's mining property has changed hands. A syndicate composed of some 25 Chinamen purchased the property on the 6th and took possession on the 7th instant. It was sold for a good round sum of money, but in our opinion for less than its real value. Ga Sue, of this place, is the agent for the Chinese owners, many of whom are from Dutch flat.

Placer.

FOREST HILL.—Placer *Argus*, May 7; A big clean-up was made at the May Flower mine on Saturday. The May Flower bas been the dispenser of more money on this divide than any company for a great many years. The Washington mine, situated about a mile from Forest Hill, having been freed from the water in the works, has resumed operations this week. The main shaft has been sunk to a depth of 340 feet, and the prospects are regarded as very flattering by those most directly concerned and who are best able to judge. George T. Murdock, an experienced miner, is the superintendent of the mine, which employs fifteen or twenty men. The Baker Divide mine, located on Shirt-Tail canyon, about six miles from here, is said to be giving rich promise. At present the company are building houses for the use of the workmen engaged in the mine. They are also constructing about a mile and a quarter of flume to supply water whereby to run the air compressor. Work in this mine is run mostly by contract, I believe. Wm. Dodge, Jr., is the superintendent.

IRON MINE.—A representative of the *Herald* made a visit to the Iron mine or Hotaling recently, and found quite a number of people in the town and some work going on. A force is at work in the mine taking out ore, of which they have considerable on hand. Marble stone, for slag, is piled up in large quantities, and the immense coal sheds are full to the gable. At the kilns near the works is about 5,000 cords of 4-foot wood, and scattered throughout the woods the company has from 10,000 to 12,000 cords more already cut. Everything around the place would seem to indicate that the company is getting ready for a big run, although nobody seems to be able to answer the question as to when they expect to start up.

FOREST HILL.—Placer *Herald*, May 9: Work has been started up again in the Washington mine, near Forest Hill. A tunnel is being run to tap the shaft at 60 or 80 feet through which the water from the pumps will be emptied to save lifting so high. The shaft, we believe, is down to gravel, and as soon as the water can be gotten out Mr. Murdock, the superintendent, hopes to commence drifting.

Plumas.

FROM WOLF CREEK.—Cor. Plumas *National*, May 9: Away up in the pine mountains of Plumas, two or three hours' ride from Greenville, on the west bank of Wolf creek, is located the mine and mill of the Gold Stripe Mining Company. In the early 50's Wolf creek yielded the placer miner large returns for his labor, and more than one fortune was extracted from its gravelly bed. But nearly all the old-timers have long since abandoned Wolf creek for more promising mining regions, until, at the present time, but one or two of the original miners remain; and they, seemingly loth to forsake the scenes and associations of lang syne, still manage to make a living by turning over again the "tailings" that were worked for the first time more than a quarter of a century ago. Hardly had the placer miner turned his back upon Wolf creek before the quartz prospector came in. Immense quantities of float quartz were to be found on every hand, and it was not many months before several promising ledges were discovered. The owners of these ledges being poor men, but little more than assessment work was done on them for several years. About ten years ago, however, the Gold Stripe Mining Company, (a New York company), purchased the Wisconsin mine, put up a large mill and went to work in good shape. This venture proved so remunerative that another mine, the Great Western, was also purchased by the Company, and extensively developed. These two ledges furnished sufficient ore to keep the mill pounding away for seven or eight years, and during all this time good dividends were realized. During the time that the mill was running there was quite a lively little village on the banks of Wolf creek, and which bore the same name as the creek. But about three years ago the company lost the ledge, and the works were shut down, and since then but little more than assessment work was done. But the indications now are that this dreary monotony will be agreeably varied during the coming summer. Mr. Standart, the superintendent of the company, is now in New York City on business connected with the mine. During his absence a force of six men are engaged in sinking an air shaft to connect with the main tunnel, and a few more days will suffice to complete this part of the work. Mr. Standart is expected back, and he will immediately put a force of men in the tunnel to run it ahead at least 250 feet and perhaps farther. It is thought that by running ahead this distance the main ledge will be tapped, and if so the mill will be at once started up and good times will come again. In addition to the above named mines there are several other ledges that have been more or less prospected. The trouble with these latter is that they are owned by parties who do not possess the necessary capital to develop them, and the probabilities are that these ledges will remain comparatively worthless until capital can be induced to take hold of them.

A VALUABLE MINING PROPERTY.—Greenwich *Bulletin*, May 6: Near the head of North canyon, just below and north of the Round Valley reservoir, is a mining property, or series of properties, which is destined to be in the county second only to the Plumas Eureka. This series of claims, beginning at the bed of North Canyon and extending westward, are, in their order, as follows: First, the Johnny Bull, 320 feet in width and joining on the east end of the Ellis. Second, the Ellis, 1,500 feet in length. Third, the Pacific, joining the Ellis on the west and running nearly at right angles to it, 500 feet in width. Fourth, the Compromise, lying between the Pacific and the Forest King, 200 feet. Fifth, the Forest King, 1,500 feet in length. Fully twenty years ago, ground sluicing on the line of this series of claims was done near the top of the hill. It paid richly. Less than a year ago the Forest King was discovered. Work was begun at one, a mile leased and the ore tested. A large profit was obtained. A second tunnel was run in this mine, which proved that the pay chimney widened, lengthened and became richer with depth. The hauling of ore from the tunnel has already begun, and crushing at the Arcadia mill will commence in a few days. The Ellis is owned by J. R. Drury. In a tunnel run 350 feet, Mr. Drury has fine pay ore in a large ledge. Experienced miners whose judgment is reliable say that it is the best mine in this part of the country, the Green Mountain not excepted. This ledge tapped by a tunnel run on a level with the bed of North canyon, would give 1,000 feet of backs. The extraction of ore from the tunnel which has already been run, could begin at once, but the owner is unable to erect a suitable mill, which should be located at the bed of the canyon. A good site for a mill could be obtained. Situated below the level of the Round Valley reservoir, and but a short distance from that body of water, as the mill would be, an enormous water pressure could be utilized for running the machinery.

INDIAN VALLEY.—About fifteen men are now employed in connection with this mine. A tunnel is being run to tap the Indian Valley shaft. At the junction of the shaft and tunnel hoisting machinery will be placed to be run by water-power. The water from the ditch will be conducted by a pipe down the shaft. The plans and drawings of the necessary machinery, etc., have been submitted by Mr. J. P. Kenner for the consideration of the company. As soon as can be done to advantage, a large force will be employed.

LUCKY S.—Plumas *National*, May 9: Uncle John Hardgrave, of Taylorville, gave us a call Tuesday, and reports this mine running steadily on good rock and is making a good showing. Everything indicates that the owners have a good paying property. The men that put up their money to develop the country are deserving of success, and we hope they may make a fortune out of it.

Sierra.

GRAND PRIZE.—*Mt. Messenger*, May 9; The main tunnel of this company is in 1,660 feet, and now being run through soft bedrock. An upraise was recently made of 15 feet to lava through which a drift was run 25 feet to the apparent edge of the flow where fine, red-colored cemented gravel was found with bedrock at a half-pitch into the mountain. The indications are very favorable for an early development of a rich, wide and extensive pay channel eastward up the ridge—a large tract of unprospected country for miles to the Red Oak mine. The Bald Mountain Co. has just completed a shaft to bedrock on the rich channel they have been working lately, some two hundred ft. further upstream than they have heretofore prospected. A nice looking bed of gravel was found, but it is thought that the lowest part of the channel was not reached. The company will clean out the shaft in Lowel avenue, and more thoroughly prospect the channel at that point. The Young America Company expect to have their wagon road to the ledge from the Sierra valley road completed this week. Carpenters are busy getting out timber for the mill. Haggerty and Garfield will furnish the lumber, and will commence hauling as soon as the road is completed. Mr. Deidesheimer has made arrangements below for ample funds to put the mill in working order, and to fully develop the ledge. The amount secured is said to be $15,000.

THE WALLIS CON.—The Wallis Con. Mining Co. have commenced work in a tunnel at Jim Crow canyon with the intention of running into the ridge for the lead. A special meeting of the company was held at Forest City last week and James Lowell elected as director, to succeed H. C. Stout, deceased. J. O. Jones was elected secretary. This company owns a very valuable tract of mining ground on the ridge above Forest City, and it is only a matter of time when all the owners will probably be made rich out of it.

MILL TO START UP.—Sierra *Tribune*, May 8: The quartz crusher, purchased of Taylor & Forbes, at this place, has been placed in position at the Belmont mine, Poker flat, and will be started up to-day. There are already about 60 tons of ore on the dump. The mill will crush about five tons of ore per day and the owners do not anticipate any trouble in keeping it running steadily. We expect to receive some good reports from the Belmont mine in the near future.

THE SUNNYSIDE.—At the Sunnyside gravel mine, the main tunnel has been run in 300 feet. A raise of 40 feet was made from the face of the tunnel and a drift run ahead from that 60 feet. From the present indications it is expected to strike the channel in about 200 feet. The owners of this claim are Messrs. Hougb, Dorsey, Carmichael and Reynolds.

BULLION YIELD.—One hundred and fifty ounces of gold is what the Bald Mountain Extension Company, at Forest City, cleaned up Sunday as a result of their week's work in the South fork ground. The total yield of that mine for the month of April was 753 ounces of gold. Not a bad showing.

WORKING IT UP.—H. H. Purdy, who has control of the Good Hope quartz mine, at this place is negotiating with parties below to operate the property. The Good Hope is known to be a good mine.

BUNKER HILL.—At the Bunker Hill claim, situated near American Hill, they are in fine quartz gravel. A gangway is being run to the right of the main tunnel at present.

Shasta.

PROSPECTING.—Shasta *Democrat*, May 6: About 20 prospectors are on Squaw creek hunting for gold leads. It is thought that the Bullychoop tollroad will be completed in about 6 weeks. Several miles of the worst part of the road have been finished. Messrs. Hughes, Scott and another gentleman have struck a fine prospect of silver ore on the Silver King belt north of the Silver King. The ore assays in gold as well as in silver. Mr. Russ, an old Buckeye miner, recently struck a rich pocket near Buckeye and has been taking out from $10 to $30 per pan, and it does not appear to be near worked out yet. The Whitton & Small mine on Squaw creek was bonded last week to San Francisco parties for a period of 5 months for $10,000. One thousand dollars was paid down Mr. J. W. Stoufer, assayer, returned yesterday morning from a trip through the Backbone region. He went over considerable of a mineral belt where, in his opinion, some good mines will be discovered. The people of Copper City are elated. The Winthrop Mining Company have milled about 20 tons of ore with very satisfactory results, and have proven beyond a doubt that they can work the refractory ore and make a good profit. The company is building another furnace and intend to further enlarge their milling capacity. The Scott Valley *News* says that much interest is manifested in mining circles over the projected draining of a creek fabulously rich in placer gold, but cannot be worked owing to the great volume of underground water. This stream to the extent it has been worked has paid remarkably well in former times, and if the scheme of drainage is succesfully carried out vast sums will undoubtedly be extracted. A. J. Loomis and others of Red Bluff are interested in the move. Two mining men from Arizona, Messrs,

Gilchrist & Finley, in company with Jim Brincard and Andy Fife, have located a gold quartz vein on Salt creek a short distance this side of Lower Springs. Formerly the mine was owned by John Tiffin and a man by the name of Tilden, who years ago sunk a shaft on it and took out rich rock near the surface, when the pay run into heavy sulphurets which they could not handle, and finally they practically abandoned the mine. The new locators have pumped the water out of the old shaft and at the bottom found ore that assays between $4.000 and $5,000 per ton in sulphurets. Messrs. Gilchrist & Finley claim that the rock is tellurium gold rock, a character of ore they came to this county especially to find.

Tuolumne

ARGENTUM.—Tuolumne *Independent*, May 9: Argentum mine, 8 miles N. E. of Columbia, is looking well. They have a 36 to 40 inch vein, which shows first-rate. They washed up Saturday night, after a run of 60 tons of quartz, which yielded $10 per ton in free gold. The rock is also heavily charged with sulphurets, which are estimated to be worth $2,000 per ton. It is cotemplated to increase the capacity of the 5-stamp mill to 15 or 20 stamps. It is also the intention to build a road from Columbia to Italian Bar, and also to the mine. It is considered cheaper to locate the mill at the river, as there can be obtained unlimited water-power, and the rock can be delivered there, from the mine at 50 cents per ton.

RIVERSIDE.—It is said that Messrs. Grove & Star, of San Francisco, owners of the Riverside, will start up that mine right away. They will continue work on the lower tunnel, which is now in about 400 feet, and push it until they strike the main pay chute. This will tap the vein some 400 feet below the surface. They will also put a force in the upper works and get what ore they can, until the main chute is struck below by means of the tunnel.

Messrs. Bluett & Prof. Shrall have struck some pieces in their mine on the Italian Bar trail. Wm. Erwing has been gathering in a few chispas from his mine during the past spring. Prospects are very favorable at the Gem mine, near Gold Springs.

NEVADA.

Washoe District.

CON. CALIFORNIA AND VIRGINIA.—Virginia *Enterprise*, May 9: The main southwest drift on 1,750 level has been turned a little more to the south in order to avoid the bad working ground of the burned out stopes, and come to a connection with the Gould and Curry 1,700 level sooner for air connection. About 40 tons per day are extracted from this level on company account, assaying about $20 per ton on the average. The ore is worked at the Morgan mill, on the Carson river. The ore stopes of the old bonanza section, between the 1,550 and 1,200 levels, are yielding over 100 tons per day, assaying about $21.50 per ton on the average. This ore is extracted under the Jones lease, and is worked principally at the Eureka mill, on the Carson river. The heavy timbers for the new gallows frame over the old Consolidated Virginia shaft are being prepared, and the frame will be up in working position in about two weeks.

HALE AND NORCROSS.—The big hydraulic pump kept up its lick steadily yesterday, reducing the flood of hot water quite rapidly. Last evening it had it reduced down to the cap timbers of the 3,000 level and the drainage of that level was commenced. Superintendent Keating says he expects to have both levels sufficiently drained and cooled off to resume work on both the 2,900 and 3,000 levels the first of next week. The much needed ventilation from the Combination shaft cannot be secured until the water is out of the 3,000 level.

OPHIR.—An upraise will be started to-day from the 500 level, to connect with the old Mexican shaft. The water has been slowly draining from the shaft, through this level, for some time past, and now it is thought feasible to make connection with it by means of this upraise. The waste from the explorations of the Mexican and Union Companies, on their 500 level, and also that of the 1,500 level explorations of the Consolidated California-Virginia Company, is all hoisted through the Ophir shaft.

BALTIMORE CONSOLIDATED.—The new roasting furnace is about completed, and the tributers working on the 450 level will shortly hoist their accumulated ore to the surface to be dry crushed, roasted and amalgamated. They have over 100 tons of it. The parties working on the 225 level are finding some very good ore, which they are saving for future reference.

CROWN POINT.—Under the Jones superintendence and management, the low-grade leavings from the old bonanza sections are being actively extracted, after the style of the Jones lease in the old bonanza sections of the Consolidated California-Virginia.

ALTA.—Some more small stringers and feeders of good ore have been found in the prospecting above the 950 level, which are being extracted and saved for reduction. They may lead to a bonanza of some kind yet.

YELLOW JACKET.—Stoping out the large reserves of low-grade ore in the old upper workings still progresses at a lively rate, from the 1,200 level up. The supply seems almost inexhaustible, and the ore is of pretty good grade.

CHOLLAR.—No new feature has, of course, been developed in Chollar except a full proportion of the hot water borrasca invading its adjoining neighbor, the Hale and Norcross.

KENTUCK.—The extraction of low-grade ore supplying the Rock Point mill, on Carson river, goes right straight along, and the old stopes hold out well.

MEXICAN.—The joint Union and Mexican drift, running north on the 500 level, is being advanced at the rate of 50 feet a week in good working ground.

GOULD AND CURRY.—On the 1,000 level the main lateral drift south is still being advanced at the rate of about 50 feet per week, toward the Savage.

OVERMAN.—About 10 tons a day of low-grade ore are now being extracted from the 226 level, through the old Petaluma-street tunnel.

SIERRA NEVADA.—Good work is being done in advancing the main north lateral drift, the ground working well.

BEST AND BELCHER.—The northwest drift from the main north lateral drift, on the 1,000 level, is being steadily driven ahead.

BELCHER.—The old upper workings still continue their regular yield of low-grade ore, with plenty of it in sight.

Centennial District.

BLUE JACKET.—Elko *Free Press*, May 8: The Blue Jacket mine, in Centennial district, in the northern portion of this county, which belonged to the estate of Thomas Blythe, the deceased San Francisco millionaire, has been purchased by James B. White, for $135,000, and work on the mine will soon be resumed. Monday evening J. M. Dawley, J. D. Dunlap and W. D. Fredericks arrived from San Francisco on their way to the mine for the purpose of taking charge of the property. While here Mr. Dawley purchased a team from W. T. Smith, and will take out the necessary provisions, etc., from Tuscarora, for which place the party departed Wednesday morning. A force will be put on at both the mill and mine. This is considered valuable property, though it has not been worked for several years. The resumption of operations will undoubtedly make things lively in that district.

Dun Glen District.

LOOKING WELL.—*Silver State*, May 8: Stephen Thomas, who came over from Dun Glen yesterday, reports the Ross mine as looking well, the mill as running steadily on gold-bearing quartz. Thomas & Hendra are working the Good Hope mine, and have now about forty tons of ore out, much of which is rich in gold. Heretofore they have been reducing the ore in an arastra, but they have concluded to ship some forty or fifty tons to J. F. Clark's mill, on the Humboldt, below Mill City, and have it worked. There are several gold-bearing veins in Dun Glen, but only the Lang Syne, or Ross mine, and the Good Hope are being worked at present.

Tuscarora District.

MAYFLOWER.—*Times-Review*, May 5: The Mayflower mine near the North Belle Isle bids fair to develop into one of the principal bullion producers of the district. It is owned by Frank Parsons and Geo. Bird. The incline is down 40 feet. The ledge is of good proportions and well-defined and is producing at that depth a considerable quantity of antimonial silver ore of a high grade. It has continued to improve from the surface and the present indications justify the presumption that a short distance below a compact and continuous vein of the same character of ore will be developed.

NAVAJO.—Drift and cross-cut on the 650-foot level were extended 58 feet the past week. On the 350-foot level the work was advanced 56 feet. West cross-cut, 150-foot level, extended eight feet. Fair progress made with the work at all other points.

INDEPENDENCE.—*Times-Review*, May 8: Fair progress is being made in the upraise from the 400-foot level. Repairs in No. 1 shaft are nearly completed, nothing special at any point to note.

ARIZONA.

MORENCI.—Clifton *Clarion*, May 6: The mines of the Detroit Copper Company have never looked more promising than at the present time, particularly the Yankie and Montezuma. Large bodies of ore have lately been opened up in what is locally known as the West Yankie, which, from its position in juxtaposition to the wire tramway, on which two intermediate stations have been erected, renders the ore comparatively easy of access from the said stations. The ore is transferred to the Montezuma ore shoots. The portion known as the Middle Yankie is showing large and extensive bodies of blue carbonate ore. The ore from this part of the mine was formerly conveyed to the furnaces by means of a burro train, but is now connected with the main Yankie shaft by means of a 200-foot tunnel, and hoisted to the surface by means of a 25-horse-power hoisting engine, thus effecting a saving of $1 on every ton of ore hauled.

IDAHO.

WOOD RIVER.—Salt Lake *Tribune*, May 8: Mr. James McGregor came down from Wood River yesterday, and reports the camp on the river very quiet. The trouble with the Miners' Union is ended, and a large number of mine owners made a reduction of wages on the first instant to $3.50 per day, to be followed by all others on the 15th. Mac. says times are liable to remain quiet for some time, but a large number of moneyed men are expected to visit the river during the present summer to look about for investments, and he anticipates during the fall some transfers of property. Generally speaking, the mines and prospects are all looking well, and every indication points to permanent prosperity. Men with small prospects are holding on tenaciously, prospecting carefully as they go, in anticipation of a revival of better times, when they hope to make sales or secure sufficient capital to develop ther properties. Mr. McGregor thinks the general reduction in wages of 12½ per cent will result in the employment of 20 per cent more men, largely increased shipments of ore, and prove an advantage by way of inducing the investment of outside capital.

A MILL FOR THE GOLD BELT.—Wood River *Times*, May 6: The first wagon load of machinery for the mill to be erected at the head of Rock creek left Hailey yesterday, and the remainder will be hauled out to the site before the machinists are ready for it. The foundry work alone weighs over 40,000 pounds. The mill will be erected and got ready to run as rapidly as possible. The property of the company constructing the mill is said to be bonded to an Eastern syndicate for $300,000, the bargain to be a sale provided the ore pays a certain profit per ton by mill process. It is not certain that it will, however, as the character of the ore may be such that a different process may be required. But as there is plenty of ore there, if the first process tried does not extract the precious metals, very little time will elapse before the right process shall be ascertained and applied. If the mill about to be erected works successfully the Rock and Camp creek district will be the seat of as big a mining boom as was ever seen anywhere.

NEW FINDS.—Houston *Press*: During the week past several good prospects have been located near the head-waters of the Alder and Antelope creeks. Some finds of very fair ore were made on the divide a little north of the Big Copper group, and some fine specimens were brought in from the foothills west of town. From one of the finds on Alder creek—a ledge which has been traced nearly a quarter of a mile—a specimen was brought in which assayed 168 ounces in silver and 23 per cent in lead. This promises to turn out to be another bonanza mine for Big Lost River. The mining outlook is brightening very rapidly in this section.

FROM RESURRECTION DISTRICT.—J. A. Edie is in from Silver creek and Resurrection district. He says about the only development work going on there is on Hon. John Hailey's claim, which is showing up magnificently. The ledge is "so big you can't tell how wide it is"—probably from 60 to 100 feet. Assays run from nothing to $200—gold and some little silver. There is about 500 tons on the dump, that ought to average $20 under the stamps. Mr. Hailey will be here some time this month, and will probably take immediate steps to erect a mill on Silver creek or near the mine.

LOST RIVER.—Wood River *Times*, May 6: The usual high water in Big and Little Lost rivers has been much below the average this spring. The Monarch mine, owned by Messrs. Curtis & Driscoll, is now classed among the best ore-producers. Clayton is reported to be a lively camp—one of the best, in fact, in the country, all things considered. The smelter started up a few days since, and money is plentiful. A big strike is reported in the Alice mine. Just how extensive it is, is not known as yet.

MONTANA.

MONTANA.—Butte *Miner*, May 6: Everything about the mines and works of this company show a remarkable activity this week. Preparations are being made to put in position another new boiler at the Colusa mine. This makes the second boiler put up by this company in the past few weeks. At the company's smelter everything is in working order the same as usual.

PARROTT.—During the past four or five days work at the mine has been resumed, and about 70 men are now employed there, under the foremanship of B. Tibbey, in extracting ore. At the smelter things in general have assumed a rather more busy appearance, and some 60 men are now at work there. The concentrator will start up to-day, everything being in readiness, while the reverbatory furnaces, it is expected, will be running again in full blast by the 10th inst. In fact it is conceded by that time everything will be working except the old concentrator.

GREAT EASTERN.—Ore taken from the bottom of the shaft is of excellent quality, avcraging from 50 to 80 ounces. Some three years ago a large, rich boulder, about a ton in weight, was found near the surface where the shaft now is. The boulder assayed 328 ounces in silver, and the owners of the property are now confident they have struck the ledge from which it is supposed to have come. Consequently they are vigorously at work in timbering and sinking the shaft.

ELLERMALOU.—A rich strike is reported at this mine which is located about three miles to the northwest of Butte. A rich vein of ore which runs way up into the thousands has been cut near the surface. On last Thursday seven tons of this ore were extracted from what is known as a blanket lead, but which is now dipping into the earth at an angle. A shaft will be sunk immediately.

ALICE.—The work of sinking the main three-compartment shaft has steadily progressed until the 800-foot level has almost been reached. This will require but a few more days when a station will be cut. The Alice still holds its reputation as the best paying investment of capitalists west of the Rockies. To-morrow's shipment will include 14 tons of bullion, with an aggregate value of $12,000.

SWANSEA.—During the week another cross-cut has been started from the main drift, running north, which looks exceedingly well. A small lead of rich copper-silver ore has been struck, which gives rich promise. Another cross-cut on the same drift on the 200-foot level is entirely in vein matter. The mine is being thoroughly timbered and the work of prospecting progressing rapidly.

BUMMER.—Work on this property is progressing rapidly and a ledge three feet wide of 40-ounce ore is looking more favorable as depth is attained. About 30 tons of this ore was shipped last week to the Lexington mill for reduction.

WILD BILL.—Stoping continues on the upper level, while the drift in the lower level is in about 80 feet, and looking well. About 100 tons of ore per week are taken out and shipped to the Oxford Copper Company at Constable Hook, New Jersey.

LITTLE DARLING.—During the past week a great deal of new work has been done and the ore bodies are improving. Some 25 men are now employed and the mine is furnishing sufficient ore to keep ten stamps at the Lexington engaged.

COLUMBIA—Stoping which has been progressing of late, will cease and during the coming week the work of sinking the shaft will be resumed. About 25 tons of ore of excellent quality is taken out every week.

CHIEF JOSEPH.—The low-grade ores of this mine are being shipped as fast as taken out. The main drift is now in about 70 feet from the shaft, and progressing.

MOUNTAIN VIEW.—From south vein on the 600-foot level some very rich ore is being taken out, which appears to be gradually improving.

THE UNION.—Continued development of this mine indicates that it is one of the most promising mining properties in the district.

OREGON.

THE CLEVELAND MINE.—Bedrock *Democrat*, May 4: Many rich discoveries of quartz have lately been made on Burnt river, but probably the one on which the most work has been done is the Grover Cleveland, situated about twelve miles from Huntington and four miles from Weatherby, and one mile from the place known as the Jordan ranch. The O. R. & N. Co.'s railroad passes within one mile of the mine. At the southern boundary line of the claim an incline has been run for 60 feet, at the end of which, 30 feet below the surface, a ver shaft has been sunk about 35 feet from the bottom of which shaft drifts have been run on the ledge—south 50 feet, north 30 feet—showing the ledge and walls 60 feet below the surface. At this level the ledge is 33 inches wide, with well-defined walls—foot-walls of porphyry and hanging walls of slate. The ore is very largely decomposed and carries free gold. It is a white quartz, full of sulphurets of red and dark brown color. In much of the ore native gold can be seen, but the richest is that which is banded and spotted with dark sulphurets. Most of the latter is exceedingly rich, and assays made by D. C. Marchand, of this city, has given it as high as $800 to the ton. A great deal of the ledge matter is so soft that it can be easily crushed in one's hands. The location of this mine facilitates opening by cross-tunnels, as the hill is very steep and the vein running with hill or ridge can be cut hundreds of feet vertically below the out-cross with comparatively short tunnels, which would dump the ore on to a smooth hillside a short distance above the Connor creek wagon road, and by the use of chutes the ore could be easily conveyed from the dumps to a wagon on the road, thence to the O. R. & N. railroad track. It is the intention of the owners to ship several hundred tons of the ore to Salt Lake City over the Oregon Short Line, and there to go through the reduction works. In the same mineral belt as that of the Grover Cleveland, other discoveries have been made of exceeding richness, and upon which considerable work of development is now progressing. The gentlemen interested in these discoveries are live and energetic, and no stone will be left unturned by them that will tend to the opening out to the world the mineral wealth of their prospects. We look upon it as fortunate that Baker county has at last received as citizens men whose whole feeling goes into their work, and which will tend to the advancement of the mining resources of the entire county and Eastern Oregon.

GOOD ASSAY.—The owners of the Enterprise mine, located in the upper end of the town, sent some of their rock to Portland this week for assay, and the answer is that it goes $50.25 in gold with traces of silver. To bring matters into shape an incorporation will be formed composed of the following gentlemen: J. G. Birdsey, J. Nunan, Wm. Hanley, J. A. Cardwell and I. W. Thomas. It is the intention of the company to continue the work right along, and they now feel confident that they have struck a bonanza.

NO FAILURE YET.—*Sentinel*, May 9: While meandering around yesterday afternoon we dropped into C. C. Beekman's express office when we saw him put up a package of 25 pounds of gold dust, the result of the week's purchases from the miners living near by. The mining season has been an exceedingly poor one on account of the scarcity of water, but this showing proves that we have good paying ground if we only get water to work it.

UTAH.

REVIEW.—Salt Lake *Tribune*, May 8: The output of bullion from this point for the four months of the present year, excluding all ores, and aside from recent Horn Silver shipments and some concerns which make no current reports, has been $1,240,936.30. The week ending May 6th, inclusive, was generally warm and clear, with but occasional brief storms, all save one very light. The movement of ores and bullion has therefore been fair. The receipts in this city during that week were $82,572.58 of bullion and $13,060 of ore, a total of $95,632.58. For the week previous the receipts were $63,372.65 of bullion and $3,850 of ore, a total of $67,222.65.

The Ontario shipped during the week 45 bars of bullion, $31,665.71, raising the total shipments of the year to date, to $601,007.51. The mill is now shut down, we understand, for the annual clean-up and repairs, so no more shipments are expected for a fortnight or more. The regular monthly dividends continue with unfailing regularity of 50 cents per share. Receipts from Silver Reef for the week have been of Christy silver, 4 bars, $8,510; Stormont silver, 4 bars, $5,920; a total from the sandstones of 8 bars of silver, assaying $14,430. The Hanauer smelter produced during the week 9 cars of bullion, $19,750. The product of the Germania smelter was 4 cars, $8,706.87.

SANDSTONE NOTES.—Southern Utah *Times*, May 6: The Christy company has crushed an average of 45 tons of ore during the week. The air connections in the New Shaft are completed, and a force of men can be put to stoping out ore at any time. The California is looking fine. The bulk of the ore which runs the Christy Mill at present comes from this mine. The mine continues to improve the more it is worked. The Vanderbilt, about which there is so much talk of late, continues to show up more and more as a bonanza. The drift at the bottom of the 134-foot incline is run on the ledge twenty feet north and thirty feet south. The whole drift is in ore and there are twenty tons of high grade ore on the dump which has been taken from this part of the mine. The face of the drift is in ore from top to bottom. What she will be time will tell, and judging from present indications we think she will be immense. The Lamb & Steele is an extension of the Vanderbilt. Dick German continues to develop the mine in good shape and is taking out some very good ore. He is working for and expects to find a continuation of the Vanderbilt ore body lately struck on his claim. Winze No. 29, running between the fourth and fifth levels at the extreme south end of the Savage, is completed. A body of fine ore is opened up by this winze, which the miners have begun to stope out. A body of fair ore is exposed in the stopes of the sixth level south, which is being worked at present. The mine is producing a daily output of between 30 and 35 tons. The Thompson & McNally is furnishing between 12 and 15 tons per week. There is an abundance of ore on the dumps, and unless some act of God interferes to wash out the roads or flood the Virgin river the company's mill will continue to grind out its regular amount of ore daily—between 35 and 40 tons. Holling & Dawson have made a shipment of 50 tons of ore from the Gisborne mine, which is situated on the White Reef just south of the Thompson. The ore sampled 40 ounces. A force of men is still engaged in extracting ore. Bailey, Nesbit & Co. are working three shifts at their Leaching Works over at the old Leed's mill. They run 25 tons of tailings through their leacher every 24 hours.

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No models are required in European countries, but the drawings and specifications should be prepared with thoroughness, by able persons who are familiar with the requirements and changes of foreign patent laws—agents who are reliable and thoroughly established.

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The principal portion of the patent business of this coast has been done, and is still being done, through our agency. We are familiar with, and have full records, of all former cases, and can more correctly judge of the value and patentability of most inventions discovered here than any other agents.

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We invite the acquaintance of all parties connected with inventions and patent right business, believing that the mutual conference of legitimate business and professional men is mutual gain. Parties in doubt in regard to their rights as assignees of patents or purchasers of patented articles, can often receive advice of importance to them from a short call at our office.

Remittances of money, made by individual inventors to the Government, sometimes miscarry, and it has repeatedly happened that applicants have not only lost their money, but their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees intrusted to our agency.

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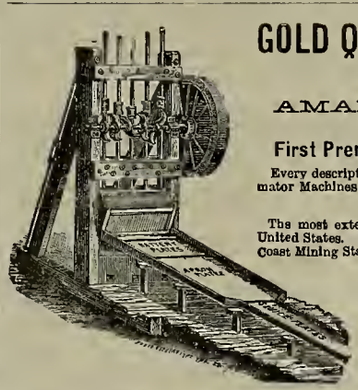

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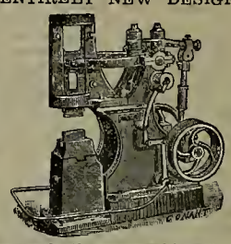

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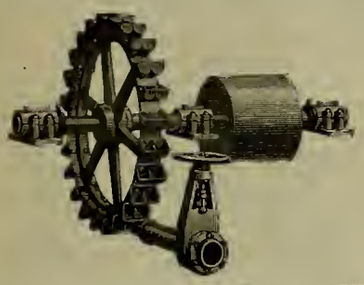

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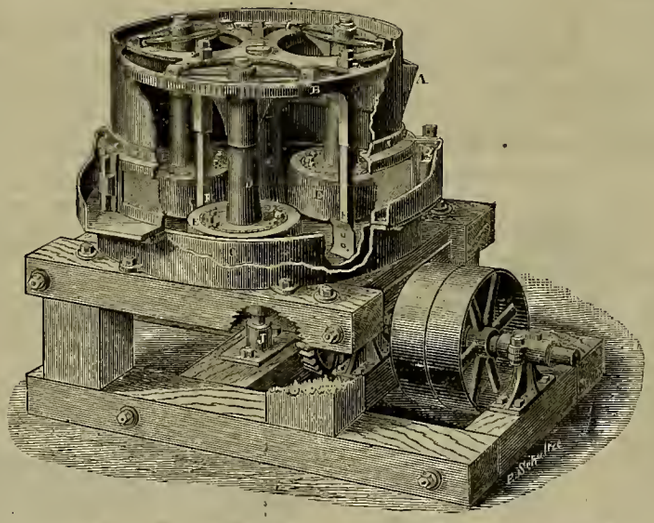

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A Glance Over the Mining Field.

The Granite Mountain and Hope mines and mills at Phillipsburg, M. T., are in full operation. The former produces from $3,000 to $4,000 per day in silver bars, and the latter from $800 to $1,000 per day.

The Cornish pump at the Alice mine, Butte, Montana, cost $57,118.

As showing what "discount" on silver means, the Alice mine, Montana, yielded between January 1st and April 1st, $262,272, with $47,772 off for discount on silver.

Wells, Fargo & Co. have closed their office at the Vulture camp, Arizona. The business of that office was mainly derived through the mining company in the shipment of bullion, and the recent loss of $6,000 by highwaymen has convinced Wells, Fargo & Co. that the profits derived are too little to run such large risks in the future.

One of the largest copper properties in Arizona has just been located, about twelve miles west of Tucson. It is said to be a mammoth quarry of splendid ore.

Mr. Carl Henrich, lately superintendent of the Detroit Copper Company's smelting works at Morenci, Arizona, has left San Francisco for New Zealand, where he is to erect and manage copper smelting works, the plant for which has been built by Messrs. Frazer & Chalmers, of Chicago.

The Shasta *Courier* says that the town is full of men bound for New River. One of the prospectors passed up with a pack mule on which hung a label reading: "This fellow has packed grub and blankets for me to Denver, Leadville, Deadwood and Tombstone, and now we are bound for New River to strike our eternal fortune and live on barley and beer for the rest of the time allotted to us on earth."

The shipments of little dabs of gold from Lone Pine, Inyo county, during April, aggregated about $13,400. Most of the metal came from Beveridge. This is quite a nice little sum to be added to the business of a village during one month.

The Nevada *Transcript* says that Postmaster Williams has been figuring a little, and he finds that during the past 22 years there have been shipped through Wells, Fargo & Co.'s express office at Nevada City gold bullion weighing in the aggregate 50 tons avoirdupois. This represents considerably less than half (probably about one-third) of the gold produced by the mines of Nevada county within the time specified, the other bullion shipping points at present being North San Juan, Sweetland, French Corral and Grass Valley.

The last week's work of the Bald Mountain drift gravel mine, Sierra county, cleaned up 209 ounces of gold—a pretty good showing. The mine yielded in April 753 ounces of gold.

The new works of the Selby Smelting Company, at Vallejo, will soon be completed. A shaft sunk to obtain fire-clay has struck what seems to be an endless supply of the material.

The Carson & Colorado Railroad is said to be doing a better business now than for many months. This looks well for the mining region thereabouts.

From a twenty-five days' run of the Delhi quartz mine, near Columbia Hill, a bar of gold was produced worth $6,000, the cost of producing it being $1,200.

Dan De Quille has an article upon "Americans as Silver Miners" in the issue of the Chicago *Current* of May 2d. He describes the crude methods under which the first mining operations were conducted, and tells how, by close attention to the work and inventions made upon the spot, Americans have come within a comparatively few years to be the best silver miners in the world.

The concentrations from the Paradise Valley Company's mine are worth $650 per ton. About 27,000 pounds were shipped to Omaha the other day.

As indicating what very low-grade gold ore can be worked to profit in this State, where there is plenty of it, it may be stated that over 80,000 tons of ore were worked during the past two years by a mill in Calaveras county, the yield per ton, ranging from $1.80 to $1.95 per ton. The ore assayed a little more, but all was not saved.

The Virginia *Chronicle* says: "The bullion product of Storey county for the year 1885 will foot up over $8,000,000 or nearly $550 per head for the entire population."

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ASSESSMENTS.

COMPANY.	LOCA	N. NO.	AM'T. LEVIED.	DELINQ'NT. SALE.	SECRETARY.	PLACE OF BUSINESS
Alaska M and M Co	Alaska	10	35	Apr 3..May 4	May 20..T J Hay	306 Pine st
Alaska Marble M Co	Alaska	1	03	Feb 25..Apr 18	May 16..J M Wilde	405 First st
Alta S M Co	Nevada	32	25	Apr 30..June 4	June 24..W H Watson	302 Montgomery st
Baker Divide M Co	California	9	25	May 12..June 15	July 6..D M Kent	330 Pine st
Buchanan G M Co	California	12	15	Apr 14..May 18	June 5..P J Sellwan	121 Post st
Belmont M Co	Nevada	39	15	Feb 11..May 7	June 1..J W Pew	310 Pine st
Champion M Co	California	19	08	Apr 23..June 1	June 19..T Wetzel	522 Montgomery st
Daisy Cement M Co	California	3	2	Mar 28..May 5	May 27..C J Collins	512 Montgomery st
Golden Fleece G M Co	California	1	20.00	Apr 18..May 25	June 15..F Schirmcier	Phelan Block
Hale & Norcross S M Co	Nevada	85	50	May 6..June 9	June 29..F B Holmes	309 Montgomery st
Iowa M Co	Nevada	17	05	Apr 29..June 6	June 27..C C Leavitt	510 Battery st
Julia Con M Co	Nevada	23	10	Apr 6..May 13	June 5..J Stedfeldt	412 California st
Loreto M and M Co	Mexico	08	15	Apr 28..May 29	June 22..H G Jones	327 Pine st
Maydower Gravel M Co	California	29	10	Mar 26..May 5	May 29..J Morizio	328 Montgomery st
Mexican M Co	Nevada	55	20	Apr 20..May 23	June 13..G D Edwards	414 California st
Noche Buena M Co	Mexico	11	11	Mar 27..May 8	May 29..C Hart	106 Battery st
Overman S M Co	Nevada	55	20	Apr 20..May 23	June 12..G D Edwards	414 California st
Potosi M Co	Nevada	18	30	May 13..June 19	July 10..C E Elliott	309 Montgomery st
Pinal Con M Co	Arizona	6	06	Apr 10..May 18	June 8..W Letts Oliver	328 Montgomery st
Puget Sound Iron Co	Wash Ter	11	50	Apr 14..May 25	June 25..A Halsey	328 Montgomery st
Rainbow M Co	California	13	15	Mar 14..Apr 21	May 20..P P Mohrhardt	307 Montgomery st
Santa Anita M Co	California	8	02	Apr 23..May 26	June 16..J M Buffington	309 California st
Sulphur Bank Q M Co	California	3	50	Feb 25..Apr 16	Jun 1..L Hermann	220 Sansome st
Union Con M Co	Nevada	30	25	Apr 16..May 20	June 9..J M Buffington	309 California st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Christy M Co	Utah	G R Spinney	310 Pine st	Annual	May 18

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Kossuth M Co	Nevada	C K Sturtevant	328 Montgomery st	06	Mar 16
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	20	May 28
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Feb 13
Plymouth Con G M Co	W Van Norden, Pres.		23 Nassau st N Y	50	Apr 6
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Feb 16
Syndicate M Co	Nevada	J Stadfeld Jr	419 California st	10	M y 5

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE. May 7-13	Portland. Rain.	Temp.	Wind.	Weather.	Red Bluff. Rain.	Temp.	Wind.	Weather.	Sacramento. Rain.	Temp.	Wind.	Weather.	S. Francisco. Rain.	Temp.	Wind.	Weather.	Los Angeles. Rain.	Temp.	Wind.	Weather.	San Diego. Rain.	Temp.	Wind.	Weather.
Thursday	.63	58	—	LR.	.00	76	S	Cl.	.00	75	S	Cl.	.00	63	W	Cl.	.00	71	—	Cy.	.00	71	S W	Cl.
Friday	.35	68	S	Fr.	.00	77	E	Cl.	.00	70	W	Cl.	.00	60	W	Cy.	.00	72	S W	Fr.	.03	73	S W	Fr.
Saturday	.00	70	E	Cl.	.00	78	S	Cl.	.00	72	S W	Cl.	.—	61	S W	Cy.	.03	75	W	Cl.	.00	66	W	Cl.
Sunday	.00	76	S	Cl.	.00	81	S	Fr.	.00	71	S W	Fr.	.—	61	S W	Cy	00	75	W	Fr.	.—	70	W	Cl.
Monday	.08	59	S W	LR.	.00	80	S	Fr.	.00	73	S	Fr.	.00	62	W	Cy.	.00	63	S W	Cy.	.00	67	W	Cy.
Tuesday	.30	56	W	LR.	.—	60	S	Cy.	.00	70	S W	Cy.	.—	58	N W	Cl.	.03	72	W	Cl.	.52	70	W	Cy.
Wednesday	.05	56	S	LR.	.06	60	S	Fr.	.00	66	S W	Fr.	.—	61	S W	Fr.	.00	70	S	Cl.	.02	68	W	Cl.
Totals	1.41				06				.00				.—				.06				57			

EXPLANATION.—Cl. for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature wind and weather at 12:00 M. (Pacific Standard time), with amount of rainfall in the preceding 24 hours.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Apr. 23.		WEEK ENDING Apr. 30.		WEEK ENDING May 7.		WEEK ENDING May 14.	
Alpha	1.00	1.60	.90	1.05	.95	1.00	1.00	1.30
Alta	.25	.55	.20	.30	.15	.25	.20	.40
Andes	.30	.50	.30	.40	.30	.55	....	.50
Argenta	....	....	....	....	....	....	....	.10
Belcher	....	1.50	....	1.00	1.00	1.05	....	1.20
Belding	....	....	....	....	....	....	....	....
Best & Belcher	1.85	3.20	1.65	2.00	1.75	2.75	2.40	2.95
Bullion	.40	.60	.30	.40	.35	.45	.40	.50
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	....	....	....	.25	.35	.20	.30
Bodie Con	1.40	1.60	1.50	1.60	1.50	1.60	1.30	1.50
Benton	.10	.15	.05	.10	....	....	....	.10
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	....	.35	.25	.30	....	.30	....	.30
California	.60	3.70	.70	.90	.85	1.45	1.50	1.75
Challenge	....	.15	....	....	....	....	.25	.30
Champion	....	....	....	....	....	....	....	....
Chollar	1.40	4.25	1.25	1.55	1.30	1.50	1.20	2.50
Confidence	....	1.15	....	1.40	1.25	1.35	1.30	1.50
Con. Imperial	....	....	....	....	....	....	....	....
Con. Virginia	.60	3.70	.70	.90	.85	1.45	1.30	1.75
Con. Pacific	....	....	....	....	....	....	....	....
Crown Point	1.25	1.75	1.20	1.65	1.35	1.45	1.35	1.55
Day	....	....	....	....	....	....	....	....
Eureka Con	....	5.25	5.50	7.88	7.20	8.75	5.75	8.37
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	.35	.40	....	.20	.30	.35	.35	.40
Grand Prize	....	....	....	....	....	....	....	.75
Gould & Curry	1.25	2.60	1.15	1.55	1.15	1.60	1.45	1.80
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	4.10	11.75	4.50	6.50	5.25	6.00	6.12	7.50
Holmes	....	4.00	3.65	3.75	....	....	....	4.00
Independence	....	....	....	....	....	....	....	....
Julia	....	.10	.05	.10	....	.05	....	....
Justice	....	....	....	.15	....	.15	....	.15
Martin White	....	.40	....	.45	....	....	....	.40
Mono	1.15	1.40	1.10	1.50	1.15	1.45	1.15	1.40
Mexican	.55	1.35	.60	.65	.60	.80	.90	1.25
Mt. Diablo	....	....	....	3.80	....	3.80	....	....
Northern Belle	....	....	....	....	....	....	....	....
Navajo	.90	.95	.90	1.05	1.10	1.70	1.05	1.35
North Belle Isle	....	....	....	.10	.20	.15	....	.15
Occidental	1.10	1.80	1.30	1.55	1.40	1.50	1.50	2.00
Ophir	.20	1.25	.50	.65	.55	1.25	1.10	1.70
Overman	.20	.35	.10	.15	.10	.15	.15	.20
Potosi	.70	1.75	.50	.65	.50	.65	.55	.95
Pinal Con	....	....	....	....	....	....	....	....
Savage	2.00	6.00	2.60	3.40	2.65	2.95	2.90	3.65
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	.70	1.50	.80	.90	.85	1.30	1.15	1.40
Silver Hill	.05	.10	....	....	....	.10	....	....
Silver King	....	....	....	....	....	....	....	....
Scorpion	.15	.25	.10	.15	.10	.15	.15	.20
Syndicate	.35	.40	....	.25	....	.45	....	.35
Tioga	....	....	....	....	....	....	....	....
Union Con	.50	.65	.45	.55	.45	.80	.70	1.00
Utah	1.00	1.40	....	....	1.00	1.30	1.75	2.25
Yellow Jacket	2.05	2.90	2.10	2.65	2.25	2.60	2.50	3.00
....	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange

THURSDAY A. M., May 14.

150	Alpha	1.30	
100	Alta	40c	
200	Andes	50c	
120	Bodie Con	1.50	
610	B. & Belcher	2.80	
350	Bullion	35@40c	
1100	Benton	10@15c	
1970	Chollar	2.05@2.10	
845	Con Va & Cal	1.55@1.60	
450	Crown Point	1.45@1 50	
50	Confidence	1.75	
100	Challenge	30c	
850	Exchequer	40c	
730	Gould & Curry	1.85@1.90	
770	Hale & Nor	7.63@7.75	
50	Kentuck	1.95	
900	Mexican	1.10@1.15	
100	Navajo	1.50	
400	Ophir	1.35@1.40	
100	Overman	20c	
50	Occidental	1.40	
1050	Potosi	80@85c	
1340	Savage	3.65@3.80	
320	Sierra Nevada	1.30@1.35	
100	Scorpion	20c	
300	Union	1.00	
620	Yellow Jacket	3.00@3.05	

The New River fever has abated somewhat, and prospectors seem to think Shasta and eastern Trinity afford a much better field for prospecting than the much-talked-of new El Dorado.—*Shasta Democrat.*

Mining Share Market.

Business has been rather active in the stock board this week, and prices indicate that there is hopefulness in the Comstock situation. The breakage in the discharge pipe of the big hydraulic pump at the combination shaft has caused considerable trouble, but the water is now nearly all out again. Still this accident did not seem to affect the market much, as such changes usually do. The low-grade ore bonanzas of the north and south ends show an increased yield, and are the main feature of the Comstock ore production, if not the sole future basis of its mining prosperity. It certainly will prove to be so, unless the much hoped for bonanza in the middle mines develops into a tangible reality. From 80 to 90 carloads a day pass over the railroad from Virginia and Gold Hill, the south end furnishing a slight majority of it.

The total amount of the pay-rolls of the Comstock mines for the month of April was about $110,000, of which the Crown Point, Belcher, Yellow Jacket and other Gold Hill companies have paid about one-half.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, department 10, San Francisco:

WESTERN MILL AND LUMBER CO., May 11—Object, manufacturing, buying and selling of lumber, buying, selling and improving real estate, and transacting a general merchandise business in the State of California and Washington Territory. Principal place of business, San Francisco. Directors—John F. Kennedy, Daniel L. Randolph, Angus McLeod, Sampson Tams, A. J. Turner, Colin M. Boyd, H. J. McLerie. Capital stock, $250,000, divided into 2,500 shares.

CALICO MINING AND REDUCTION CO., May 11.—Location, Daggett, San Bernardino Co. Directors—Valentine Baltz, John Kremer, Dr. Julius Koebig, H. J. Forchini. Capital stock, $30,000, in 300 shares.

NORMAN MAUD M. CO., May 12.—Location, Yuba Co. Directors—Chas. H. Wells, A. A. Hobe, Geo. J. Hobe, W. S. Moses and Chas. E. Hazeltine. Capital stock, $14,400.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

FRIEND to the rich and poor—Muller's Pebble Spectacles, 135 Montgomery St., near Bush.

Market Reports.

Lumber at Wholesale.

The Redwood Lumber Association has established the prices since the first of the year.

REDWOOD.—Cargo prices are at present as follows: Rough, merchantable, ₱ M ft., $13 00; Rough, clear and surfaced, $23.00; 1x10 Rustic, No. 1, $24.00; 1x10 Rustic, No. 2, $19 00; 1x8 V Rustic, No. 1, $22.00; 1x6, tongued and grooved, $21.00; 1x4, tongued and grooved, beaded, $23.00; ½-in.x3, Battens (board measure), $30.00; Shingles, ₱ M, $1.05.

Pine—Rough, $15.00; No. 2, $12 00; do do in lengths, $13.00; rough, 40 to 50 ft lengths, $16.00; do 50 to 60 ft, $17.00; T and G Flooring, 1x6, $26.00; do do 1¼x6, $28.00; do do 1x4, $28.00; do do No. 2, $21.00; Vertical Grain T and G Flooring, 1x6, $30.00; do do do 1¼x6, $32.00; Stepping, $37.50; Furring, 1x2, per lineal ft, ¾ c.

Lumber at Retail.

ices fixed by the association April 1st. are as follows:

Pine, Rough	$15 00
" " No. 2	12 00
" " " 2 in lengths	13 00
" " 40 to 50 feet lengths	16 00
" " 50 " 60 " "	17 00
T. & G. Flooring 1 x 6	26 00
" " 1¼ x 6	28 00
" " 1 x 4	28 00
" " No. 2	21 00
Vertical Grain T. & G. Flooring, 1 x 6	30 00
" " " " 1¼x 6, 1 x 4	32 00
Stepping	37 50
Furring, 1 x 2, per lineal foot	0¾
Redwood, Rough	17 00
" " No. 2	13 00
" Surfaced	30 00
" " 1 x 8	23 00
" " 1 x 6	28 00
" T & G. 6 in. 12 ft and over	28 00
" " " 7 to 12 ft	25 00
" " " under 7 ft	20 00
" Rustic	30 00
" " No. 2	25 00
" T. & G. Beaded 12 ft. and over	30 00
" " " 7 to 11 ft	25 00
" " " under 7 ft	20 00
" S'dlog, ¼ in	22 50
Pickets, Fancy	25 00
" Rough Pointed	15 00
" Square	14 00
Battens, ½ x 3 per lineal ft	0¾
Shingles	2 00
Laths, 1½	3 25
" 1½	3 75
Dunnage Boards less 5% delivered	16 00

Price subject to change without notice.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, May 14, 1885.

ANTIMONY—Per pound	@	—
Hallet's	12 @	—
Cookson's	13 @	—
BORAX—Refined	7 @	8¼
IRON—Glengarnock ton	25 00 @	—
Eglinton, ton	23 50 @	—
American Soft, ton	27 00 @	—
Oregon Pig, ton	@	—
Clipper Gap, Nos. 1 & 4	25 00 @	30 00
Clay Lane White	26 00 @	—
Shotts, No. 1	26 00 @	—
STEEL—English, lb	15 @	25
Black Diamond, ordinary sizes	13 @	—
Plow	6 @	8
Machinery	10 @	12
Sandersoa Bros	13 @	—
COPPER—		
Braziers' sizes	— @	25
Fire-box sheets	28 @	—
Bolt	22 @	—
Yellow Metal	14 @	15
Ingot	14 @	15
LEAD—Pig	3½@	3¾
Bar	5 @	—
Pipe	7 @	—
Sheet	8 @	—
Shot, discount 10% on 500 bag Drop, ₱ bag	1 85 @	—
Buck, ₱ bag	2 05 @	—
Chilled, do	2 25 @	—
TIN PLATE—Oldcastle	5 25 @	6 00
Charcoal	5 75 @	6 75
Coke	5 25 @	6 50
Roofing	6 25 @13	50
ZINC—German	9 @	10
Sheet, 7x3 ft, 7 to 10 lb, less the cask	9 @	10
QUICKSILVER—By the flask	33 50	
Flasks, new	1 05 @	—
Flasks, old	85 @	—
NEW YORK PRICES—		
California Borax, refined	8 @	8¼
Pig Iron, American	17 00 @18	00
Quicksilver	42½@	—
Lead	3 70 @	—
Copper	11¾@	—
Tin	18¾@	—
Bar Silver	1 08½@	—

Utah and Montana Machinery Company.

A company bearing the above title was organized in this city on the first of this month. The object and business of this company is to buy, sell, manufacture and deal in all kinds of mining, milling and other machinery, engines, boilers, mining supplies, iron and steel, and real estate. The capital stock is $50,000. The incorporators are L. C. Parke, B. T. Lacy, Joseph Powning, C. P. Mason, H. C. Newhall and J. O. Harron. The officers are L. C. Parke, president, B. T. Lacy, vice-president, J. O. Harron, secretary; C. P. Mason, manager. The treasurer is banking-house of T. R. Jones & Co., in Salt Lake city.

This company is the successor to the old house of Parke, Lacy & Co., at Salt Lake, Utah, and Butte, Montana. They will run in the same line as Parke and Lacy do here.

At both the towns mentioned establishments have been maintained, but will be continued hereafter by the incorporation under the new business title.

Bullion Shipments.

Alhambra mill, May 10, $19,890; Barber's mill, 10, $13,455; King mine, 10, $4,490; Vienna, 4, $2,040; Christy, 4, $2,280; Hanauer, 4, $2,200; Stormont, 4, $3,550; Queen of the Hills, 4, $4,400; Hanauer, 7, $2,350; Vienna, 7, $4,000; Christy, 7, $4,440; Ontario, 8, $21,714; Hanauer, 8, $2,400; Queen of the Hills, 8, $4,710; Vienna, 9, $3,890; Riter (Tintic Utah), 10, $10,500; Hanauer, 10, $7,200; Eureka, (Wood River) 10, $1,450; Lexington, 4, $23,312; Silver Bow, 8, $13,969; Alice, 6, $17,472; Moulton, 6, $11,328; Dexter, 7, $1,680; Moulton, 7, $11,264; Dexter, 7, $3,136; Alice, 8, $19,056; Lexington; 9, $17,792.

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING MAY 5, 1885.

317,072.—SUPPORTS FOR CENTERS OF MASONRY ARCHES—C. H. Ackerson, S. F.

317,288.—FOLDING DESK—D. D. Bowman, Eureka, Cal.

317,106.—SIDEWALK AND PAVING BLOCK—Henry G. Fiske, S. F.

317,107.—ARTIFICIAL FACING BLOCK—Henry G. Fiske, S. F.

317,108.—PAVING BLOCK—Henry G. Fiske, S. F.

317,013.—SEED SOWER—Jacob Price, San Leandro, Cal.

317,021.—FOOD FOR CALVES—Sam'l Sanborn.

317,041.—CARTRIDGE—Wm. Subleh, S. F.

317,044.—RAILWAY CROSS TIE—H. Thielsen, Portland, Oregon.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

FOOD FOR CALVES.—Samuel Sanhorn, S. F. No. 317,021. Dated May 5, 1885. This is a preparation which is to be used as a food for calves and young animals in the place of or as a substitute for milk; and it consists of a combination of nutritions ingredients. These ingredients are mainly sugar, nat-meal, salt, phosphate of lime, phosphate of sodium and soda mixed in suitable proportions.

MACHINE FOR GUMMING AND SHARPENING SAWS.—John Richardson, S. F. No. 316,570. Dated April 28, 1885. This invention relates to the class of machines used for gumming and sharpening saws, in which an emery or file wheel, adapted to be moved by the various adjustments of the machine to whatever position is desired, is employed to do the grinding or filing. The invention consists in a machine in which certain adjustments can be made, the object or result of which is to throw the wheel to whatever position may be required, in the best possible manner; and also to various constructions by which these adjustments are made and the wheel driven. The main adjustment to approach the wheel to the saw is given to the frame of the machine, which is adapted to be moved to any inclination on either side of a vertical line. The further adjustment of this nature, and also to throw the wheel itself to whatever angle is necessary to conform it to the edges of the teeth, is given to a cross-head or bar sliding on and pivoted to the frame, whereby it may be drawn back and forth and turned to any inclination on either side of a horizontal. A further adjustment back and forth is given to the wheel shaft directly, to fit the wheel accurately to the tooth, and a certain arrangement of belt and pulleys is made in connection with the machine, which will permit these adjustments, and yet continue to exercise their function in driving the wheel.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
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GEO. MCDOWELL—Santa Clara and Santa Cruz Co's.
G. W. INGALLS—Arizona.
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W. B. TURNER, California.
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M. C. BAKER—Napa and Yolo Cos.

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The following abstract of the table of contents will show how comprehensive the work is: Gold and Silver Bullion; Apparatus; Melting Bullion: Assaying Bullion; Humid Assay of Silver; Manipulation, etc.; Lead Ores; Copper Ores; Volumetric Assays; Parkes' Process; Amalgamation; New Process; Preparation of Potassium Zanthate; Electrolytic Determination of Copper in Ores, etc.; Assaying of Tin Ores; Assaying of Mercury Ores; Assaying of Zinc Ores; Assaying of Zinc Ores, New Method; New Assay of Nickel and Cobalt; Assay of Chromium; Assay of Bismuth; Assay of Arsenic; Assay of Antimony; Assay of Sulphur; Assay of Salt; Appendix to Part I; Notes on Crucible Assays; Weighing by Oscillations; Appendix to Part III; The Assay of Lead; The Assay of Copper.

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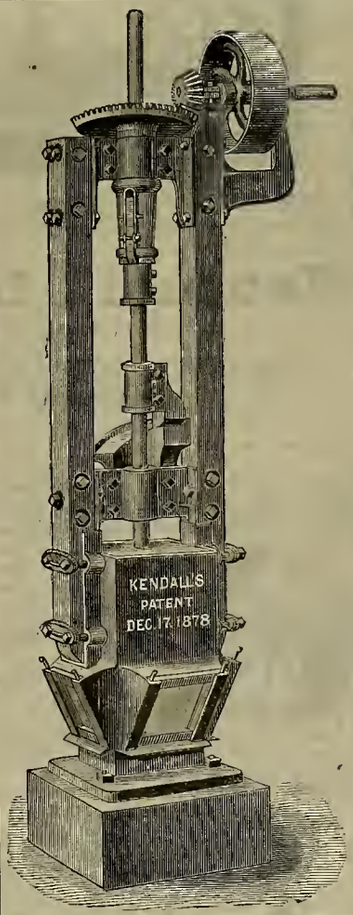

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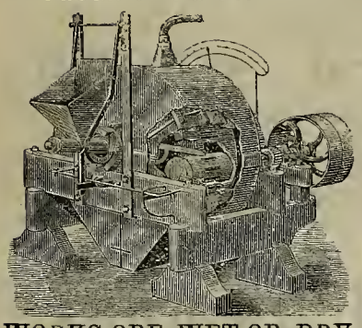

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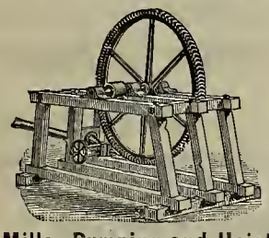

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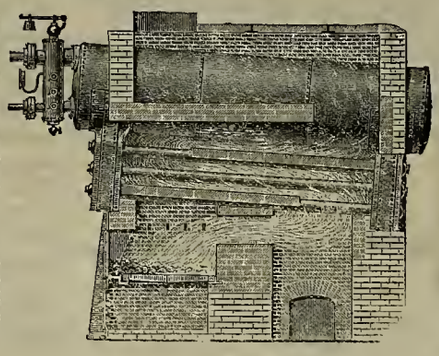

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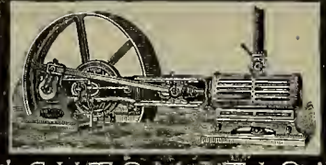

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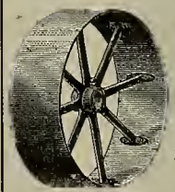

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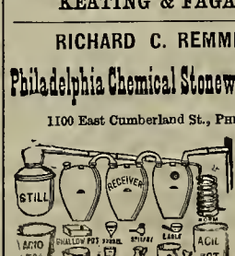

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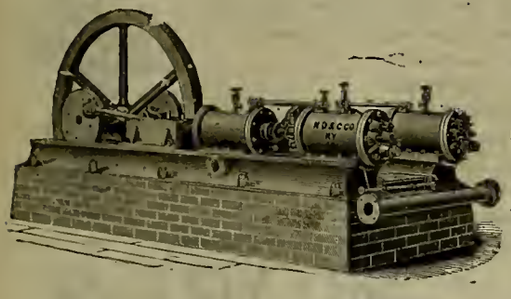

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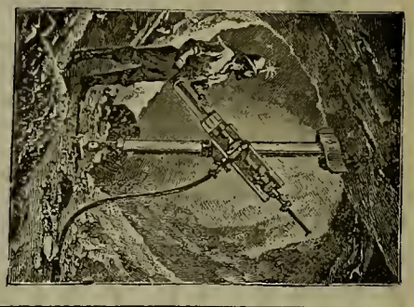

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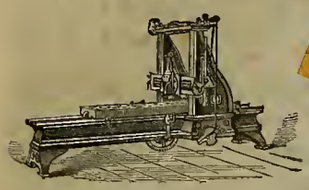

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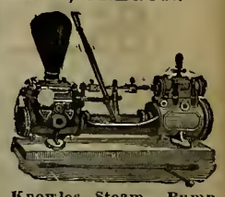

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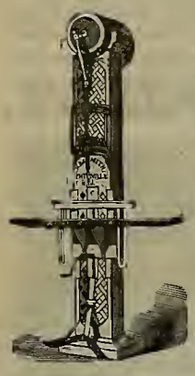

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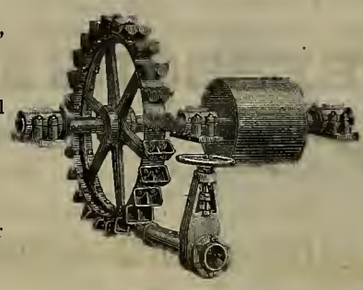

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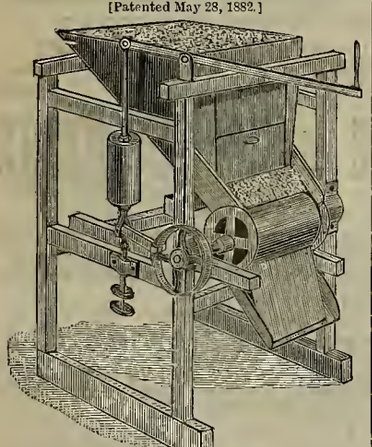
THE ROLLER ORE FEEDER

[Patented May 28, 1882.]



This is the best and cheapest Ore Feeder now in use.
It has fewer parts, requires less power, is simpler in adjustment than any other. Feeds coarse ore o. soft clay alike uniformly, under one or all the stamps in a battery as required.
In the Bunker Hill Mill it has run continuously for two years, never having been out of order or costing a dollar for repairs.

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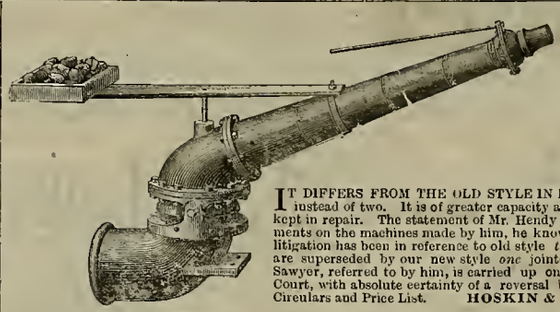

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IT DIFFERS FROM THE OLD STYLE IN HAVING ONLY ONE JOINT instead of two. It is of greater capacity and more easily worked and kept in repair. The statement of Mr. Hendy that *all* styles are infringements on the machines made by him, he knows to be utterly false. All litigation has been in reference to old style *two* jointed machines, which are superseded by our new style *one* jointed. The decision of Judge Sawyer, referred to by him, is carried up on appeal to U. S. Supreme Court, with absolute certainty of a reversal in our favor. ☞Send for Circulars and Price List. HOSKIN & CO., Marysville, Cal.

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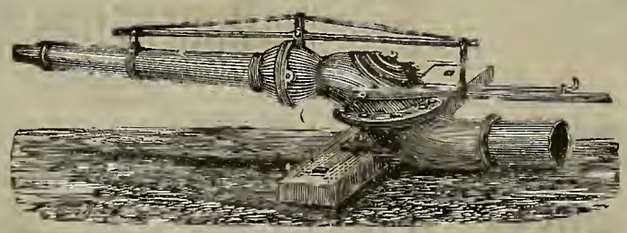

The above cut illustrates the IMPROVED FORM OF HYDRAULIC GIANTS, which we manufacture. All other styles are infringements upon this form, and a judgment stands of record to that effect, under the decision of Judge Sawyer of the U. S. Circuit Court in the matter of Hendy and Fisher vs. R. Hoskin et als.
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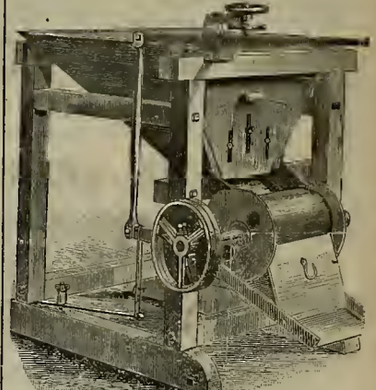
THE ORIGINAL
Roller Ore Feeder.

(PATENTED JUNE 24, 1873.)



This form of Ore Feeder is well adapted for its peculiar work.
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, MAY 23, 1885.

VOLUME XLXX Number 21.

Improving Sediment-Bearing Streams.

In order to improve torrential streams in a permanent manner it is necessary to determine how the formation of detritus can be decreased, and how the detritus can be stored near its sources. The leading principle of any improvement is to attack the evil at its very source. Small slides and erosions, in their first stats of formation, can be stopped easily at little cost, but if allowed to attain larger dimensions, they become rapidly more powerful, and require much more extensive and costly works.

In the southern and central part of Europe they have been dealing with these questions in a practical manner for many years, and a study of the work of European engineers, in reference to the permanent improvement of sediment-bearing streams, cannot fail to be of service to the solution of this question in California.

A short time since Mr. Geo. J. Specht read and elaborate paper before the Technical Society of the Pacific Coast, giving a resume of the work of this class done abroad, and describing the systems adopted for restraining the debris. Mr. Specht says the protection of the shores against undermining and the bed against erosion is principally done by the erection of "thalsperren." The German word for these structures is more significant and comprehensive than the English expression, "restraining wall." It includes works which are not walls, but have the same duty, but in a less degree.

A thalsperre, says Mr. Specht, is a structure erected across the bed of a stream to diminish the grade of the same and to decrease the power of the water; also to raise and thereby widen the bed, and to retain stone or detritus. A distinction is made between "dead and live thalsperren." The first are built of rock or timber, and the latter of hurdle-work and fascines made of green branches. The latter have that advantage over the former, that their resisting power will increase from year to year, as the branches drive their roots into the river bottom, and the growing twigs oppose greater obstacles to the water. The thalsperren of rock are either curved or straight. They can be built of dry masonry, or of masonry in mortar, or both. Wooden thalsperren should be used only where stone or rock cannot be obtained economically.

If a series of thalsperren has been built so that the line connecting the foot of the upper one with the top of the lower one corresponds to the profile of the equilibrium, *i. e.*, the grade on which the water is not able to carry away any more detritus, then it is evident that the detritus carried by the torrent will lodge above the thalsperren. If these thalsperren are sufficiently high and the river-bed has been widened by the deposits, and the water is compelled to run in the center of the thalweg away from the shores, then the problem of the permanent improvement of the torrent is solved.

But as the grades of the torrents are generally very steep, the distance between two such thalsperren would be very short, and the number of thalsperren necessary to arrive at the desired result very great, which would involve a heavy expense. Therefore, all what can be accomplished is to create the profile of equalization, and then construct such other additional works, which will prevent the erosion of the deposits and the undermining of the shores.

Such works consist generally of strong hurdles erected lengthwise equidistant from the center line of the thalweg, or the future river-bed, and of cross-hurdles placed at regular distances, forming steps, the upper edges of which lie in the line of equalization. To prevent undermining of the cross-hurdles, they should not exceed 1.5′ in hight, and the toes should be protected by rocks. The brush in the hurdles soon takes root and sprouts, thereby securing the river-bed and breaking the power of the high water. The space between the longitudinal hurdles and the shores must be filled with earth and be planted with willows set in rows under an angle of 45° with the center line of the torrent. Finally trees, driving strong and deep roots, should be planted.

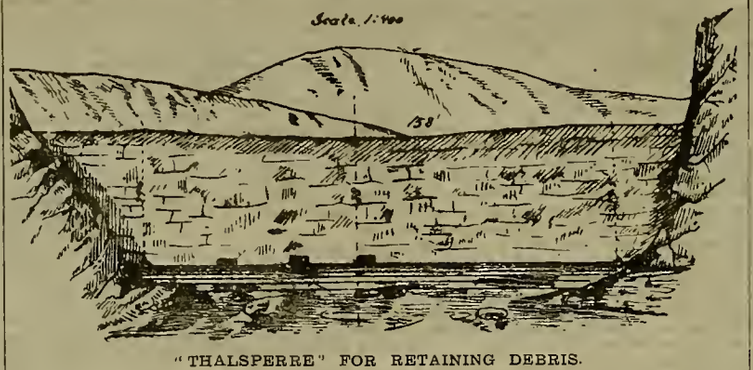
Where stone is abundant, the hurdles are replaced by small thalsperren (2 3′ high) of dry masonry (rustic-thalsperren).

The works so far outlined have been employed successfully in France; they, however, refer principally to that class of mountain streams which derive their detritus solely by undermining the shores and eroding their own bed.

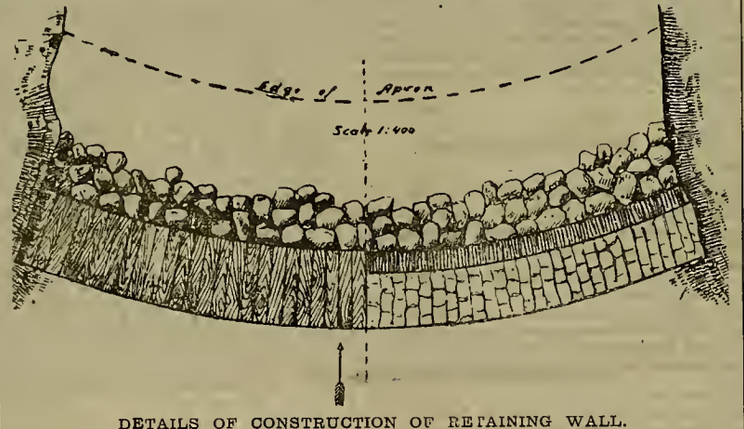
The other class of mountain streams, which receive their detritus from large accumulations of rocks, formed by the disintegration of the mountains or by glacial action, require additional works to neutralize the damaging influences of the continuous supply of material. These consist in the retention of the same near its source, or if this is not possible, in its storage near the foot of the mountains. The remedy in the first case is a restraining dam, a large thalsperre (in contradistinction to this kind, the previously mentioned thalsperren are called "consolidation-thalsperren,") built up in the mountains, or in the second case, a storage reservoir for the detritus on the talus of the torrent or at some other convenient place. As the restraining dams are built for the purpose to store as much detritus as possible, it is important that they should be built below places with gentle grades and of large lateral extent. They must be constructed so that they can be raised from time to time, by either putting a new section upon the thalsperre continuing the same slope, or by building a new one a little back of it. This latter method has the advantage that by the succession of steps the power of the falling water is broken; also that in case of injury or break of one of the steps the whole work is not endangered. The above mentioned storage places have the purpose to receive all the detritus not restrained by the upper thalsperrs. They consist of dams or levees, enclosing a larger or smaller area, with a waste-gate at the lower end, through which the clear water runs off. When the place is filled with detritus, trees are planted and another storage place is prepared.

The Ossslitzen thalsperre is the most important one in the district of the river Gail in Austria, and is represented in the figures, which are self-explanatory. The apron, made only of loose rocks, was soon carried away, but was replaced in the same manner, which will be continued until the bedrock is reached.

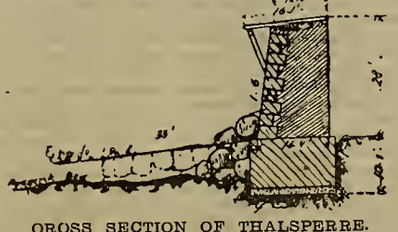
This thalsperre will store 42,000 cubic yards of detritus. It was built in 1877. In 1881 it was entirely filled up, an average quantity of 10,500 cubic yards having been deposited annually. This equally distributed over its watershed gives a wash of but 1·64″ per year.



"THALSPERRE" FOR RETAINING DEBRIS.



DETAILS OF CONSTRUCTION OF RETAINING WALL.



CROSS SECTION OF THALSPERRE.

Mine Pointers.

Ornamental gentry at high salaries may be of use to non-resident directors who put them at the mine, but nine cases out of ten they are a positive detriment to a mine. They absorb money that would be better spent in paying for labor on the works. The fewer pairs of smooth white hands there are around a mine, the better, as a general proposition.

Yea, verily, I say unto you, he that sticketh to his mine will be a bonanza king, but he that sitteth around on candle boxes and beer kegs will make a failure of it.—*Idaho Springs Gazette.*

A mere statement of assays does not prove much to an intended purchaser, but the result of mill-runs means a good deal.

A sale of a mine at a fabulous price far beyond what its real value is known to be by "insiders" instead of being a good thing for a camp is more likely to be bad for it in the long run. When purchased under such conditions there is sure to be disappointment and a consequent bad name for the district.

Mining purchases by capitalists are not always based on good business judgment. Few men can look calmly upon ore treasures in bulk and maintain their composure after they are offered an interest, whole or partial, on terms they consider favorable to themselves, and this is the direct cause of failure in mining investments; or at least this has been the case in the past.

Because a man strikes a rich claim he need not think his future is made, and then sit down and wait for 20-dollar pieces to be poured into his pockets. People do not hold open other pockets and pour money in. The finding of the claim is only the first step and it requires energy and work to utilize the discovery. The successful miners are not those who sit around and tell how rich their claims are.

News has been received that work has been resumed in the Paradise Valley and Wild Goose mines at Spring City, and everything is going along as usual at the mines and mill. The miners and Superintendent McCurdy had a conference, discussed their differences and amicably adjusted them.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Central Idaho.

Some Big, Rich Silver Mines.

EDITORS PRESS:—The Lost River region, in east central Idaho, is exceedingly rich in metallic wealth. Silver, copper and lead abound in all the ranges in large true fissures. Some of these veins contain an appreciable quantity of gold; especially those that are heavy in iron. Nearly a dozen large mining districts have been organized in this region since four years ago. In the Blackburn district near Little Lost River there are some immense veins of lead-silver ores. These lodes all show splendid bodies of galena and carbonates, most of which is of good grade; while some of the cupriferous ores, like that at the Ingersoll mine, assay over a thousand ounces silver per ton. The Ingersoll ore is principally galena and carbonates—steel galena and gray carbonates, with some black copper containing ruby and native silver. The vein is a large contact fissure between gray and black quartzite, of the potsdam period. The gangue of the Ingersoll is quartz; the vein stands vertical and shows a solid outcrop of good ore for 1,200 feet. There are close to 1,500 tons of ore on the dump, and many thousand in sight. The Ingersoll is the richest extension on the Tyndall lode. The mine will be developed this season.

Another extension on the Tyndall, known as the Daisy Black, is a bonanza. The D. B. shows many thousand tons of galena and carbonates most of which is good in silver. The whole of the famous Tyndall lode is in a quartzite formation. The vein is about five miles in length. The Alice extension, Great Northern Combination, Silver Queen and Dixie are all showing fair ore. Other extensions on the great lode show very favorable indications for subterranean bonanzas.

The Blackburn district is a new camp and its known mines all show standard geological evidence of proving a great and rich mining district. All that is needed is labor and enough capital to put in some mining machinery, concentrators and smelters. After that is done a vast amount of rich bullion will flow from this region. The Tyndall lode is evidently a Comstock No. 2, not a milling ore, but "a great zone of smelting ore" that can be easily treated and cheaply smelted. If such a showing were in Virginia City, Nevada, I can almost imagine that you would or could almost hear the miners away down in San Francisco. I know they would make a noise, and there is enough to justify a noise, a thunder and lightning clamoring, clattering racket, if you like. The best thing for the old Comstockers to do, if they have really exhausted the famous old bonanza, is to try elsewhere. I think there are greater and richer mines than the Comstock, and they will be found before another century.

Foolish Mining.

It is nonsense and foolishness to tunnel through mountains of barren granite when there are so many favorable looking outcrops showing on our mountains. That is why so much money is lost at mining. It really seems that some men expect to find mines whether there is any possible show for them to exist or not; in fact, where there is no possible show for them to exist. I know of many instances, but will just cite one here: "About 15 miles north of Salt Lake City, directly east of the town of Farmington, there are some deep cuts—holes in granite, genuine archæan granite—and this work was done by an Eastern company expecting to find "a big vein of coal." I know that practical mining men will smile at the idea, and well they may. Just think of it—coal in archæan granite! Such a thing was never known; in fact, it is a geological impossibility, for the very rudiments of geology prove it. Why do men search for coal in a formation that was formed millions of years before there was a bit of coal on the globe? But what is the use of trying to give knowledge to fools? Did they not burn Bruno to death because he taught the world is round and not a plane held upon pillars? Did not they keep the old astronomer Galileo in prison for many years for teaching the same doctrine? It really seems to me that there are many people in this world that have no desire to know the truth or any fear to believe a lie. For the salvation of humanity the time has come for science and reason to declare war against theology and modern superstition. Truth must ever be the criterion, even though the heavens fall. I am glad to know that liberal or scientific civilization is rapidly changing these many theological errors that are standing ghost-like, merely to frighten the innocent into mental slavery. There is altogether too much of this priestly blight here in Utah, and it is a shame that such traitors and polygamists are allowed such immoral liberty and protection or even toleration among honest men. What next? Well, kind reader, I beg your pardon for this digression. I will return to my subject and promise to leave it no more.

Central Idaho.

Just twenty miles east of the Blackburn mining district is the Oriental district. This district is in the eastern portion of Alturas county, and contains some large lead silver mines, prominent among which may be mentioned the Blackburn and Solfatara. These are immense galena carbonate veins, situated in a pronounced igneous formation—or rather in quartzite among dykes of basaltic lava. The Blackburn mine shows an outcrop of galena, carbonate ore from 5 to 40 feet wide, and this for a distance of 800 feet. The property will be extensively developed this season. There is already over a thousand tons of ore out, among which may be observed some big chunks of almost pure galena—going 80 per cent lead. The Solfatara is a great spur breaking squarely from the center of the Blackburn mine, and striking out at right angles to the latter. The Soltafara dips directly into a basaltic lava butte, and the indications are strong for a vast ore body under this ground. The Blackburn mine shows a variety of good heavy ore—some very fine crystalized carbonates. The wall-rock is "green with copper," and the lode contains clean, pure ore heavy in metal and free from gangue. These mines are only 6,000 feet above ocean level and can be cheaply worked. The great Snake-river lava fields come almost up to these mines. The flood is 60 miles wide and fully 600 miles long. This great outflow occurred during tertiary time. Then it happened this region was a little "warm."

The Blackburn and Solfatara are the most accessible mines in the Oriental District. Ore shipments will begin in June and continue all summer. About 20 miles north of the Blackburn is the great Viola mine, an immense vein of crystallized carbonate ore. The Viola can average more than a hundred tons daily the year round, and is producing all the time. Mr. Nichols, the superintendent, is doing good work, and his management is very creditable. About 12 miles westerly from the Viola is the Texas and Spring Mountain districts containing many veins of lead-silver ore, several of which will produce and ship ore this season, among which I can mention the Latest Out, Mammoth, Jumbo, Big Windy and Alleghany and some other prospects.

Big Lost River.

The mines on Big Lost river are copper, lead and silver—rich in all these metals. New mines are being discovered daily. The Big Copper, near Houston, is a second Anaconda. Big? yes, big! lots of it! immense! Heavy in copper and fair in silver. The Mammoth, near the Big Copper, is another good property. Many others in this region are good, rich and valuable. On Lava creek, a few miles south of this copper belt, are some big rich veins of milling silver ores.

The Horn Silver is a rich mine; several tons of this ore sampled over 800 ounces silver per ton. After a personal examination of this region, the geology, its mines, its mountains, the writer is constrained to say it is a new and important field, vast in mining resources and almost inexhaustible in metallic wealth. This country is now opening up; the grizzly must retreat. The *genus homo*, the genius of this age, is now on the ground. The time has come for Idaho to make her how and commence action. You will see good results.

COSMOPOLITE.

Oregon Mining Interests.

The mining interests of Baker county are just now assuming considerable prominence, and from the different discoveries being made on every hand and the reliability of the persons into whose possession they have fallen, the signs point to a new era in mining in this county and throughout Eastern Oregon. The decline of mining properties in other States and the Territories have sent mining capitalists and prospectors in quest of new fields for investment and work, and as this county in the past and more extensively at present presents that field they have sought for, no wonder they are turning their heads Eastern-Oregonward, where positive assurances are given them that capital invested in the mineral resources of this section is attended with that degree of safety that inspires confidence in all operators. The days of "wildcat" speculations are past, and realizing this the average mining capitalist is entertaining more safety in his investments. The people of this section have no desire to "shoe-string" the mining man who enters our boundaries for legitimate investment of his capital. This swindling business need not be feared at all. Within our county lines have already been discovered, and new revelations are coming to light every day, more legitimate paying quartz leads and offering better inducements for investment than any section in the northwest. Our gravel deposits, too, have only been partially explored, as evidenced every spring by the opening up of new ground, and the increased output of the gold product. We feel safe in saying that within the eye's reach of Baker City alone thousands of gulches will eventually be found to pay good wages to those who have the energy to bestir themselves and work them. To this end we need rustling mining men to take hold of the inducements and prospects offered, and we have no fear but that the result will be alike remunerative to them and to the whole county.—*Bedrock Democrat.*

A reduction of 50 cents per day has been made in the wages of the employes at the Navajo mine, Tuscarora. The reduction is general, with the exception of the Burleigh drillmen, who are paid at the old rate of $4 per day.

Get Your Ground Patented.

There are a great many mining claims in our three districts which have had all the work prosecuted on them and more than is necessary to obtain a patent. The title to these claims, in all cases, must be renewed from year to year, in order to keep it perfect and prevent relocations by other individuals. There are cases where prospectors continue to dwell on and work their claims steadily from year to year, and do much more than the necessary amount of work for the annual assessments. This is all well enough and not objectionable, but suppose some man comes along and is favorably impressed with the claim and is willing to pay the price asked for it, how is the owner going to guarantee a perfect title to the purchaser? The man of money will not be foolish enough to take the prospector's word for a title, and neither will he purchase unless he knows the title is bona fide. And, again. Suppose the miner suddenly comes upon a large body of ore and has no title only that which he has acquired by possession and actual work, how will he be able to keep blackmailers from trespassing upon his ground, and how can he avoid an expensive law suit? We all know that blackmailers are always on the alert—parasites, preying upon honest toil and hard labor. No man can guard his dumps so closely as to prevent everybody from knowing the nature of the ground in which he is working. A prospector may hide away in his underground workings the bunches of ore he comes upon before reaching the vein or greater body, but his dump will tell on him in spite of all he can do to prevent it. In a great many instances locks and keys do not accomplish anything. Every year the prospector's claim is watched by jumpers, who claim the right to relocate if the annual assessment is not done at the required time, and the law protects them. If a man locates a dozen or more claims in a good district and does not prosecute his annual assessment work as required, the law gives some other miner or prospector a chance. If a man expends large sums upon claims and is confident, or knows by the formation, that he has valuable ground, it is his duty to get it patented: and when he secures his title from the Government it is secure from all blackmailers or blackmailing schemes. It looks unjust and cruel for a man to be robbed of his mining claim after expending large sums of money upon it, but our law makers have said that assessment work must be done annually in order that the owner may keep in possession of his claim. It makes no difference what business matters call him away unless he leaves his claims properly guarded, when he returns he is liable to find some one in possession. The absence of tools, or any other sign of abandonment is grasped with avidity by mine jumpers, and the only safe way is a United States patent. When the miner obtains one, then he feels secure. Business may call him away for two or more years, and when he returns it will be found as he left it. It is necessary to have your claims patented and that just as soon as possible. It is the only safe way to conduct the mining business, and when a purchaser comes along you can present your bona fide title from the Government, and you sell at a good margin without any danger of lawsuits.—*Park Record.*

TEMPERING MINING PICKS.—There is probably no service to which steel can be put which so effectually tests its value as in mining picks. The tempering of a pick is a very nice piece of work and should be done with great care. In the first place a good charcoal fire is necessary; next, good steel, and then a good light hammer with a smooth-face anvil; and lastly a man is needed with a good keen eye, considerable experience and excellent judgment. No good pick can be turned out if any of the above essentials are wanting in the process. A pick should never be "upset," or hammered endwise, nor raised above a full red heat. The steel should be, moreover, heated as quickly as possible, as long exposure to heat—even if the heat is not in excess—injures its texture. Many blacksmiths find great difficulty in tempering picks, because they do not choose good steel. After being heated the pick must be worked with care, special pains being taken in drawing it out, to hammer on all sides alike, in one place as much as another, and on one side as much as the other. When ready for hardening, it should be heated in the blaze of a charcoal fire until red hot, and then plunged into cold rain-water, and kept there until it is nearly cold; but if kept too long in the water or until it is quite cold the corners are liable to fall off. Some blacksmiths use hot water; no salts of any kind should exist in the water, but the water should be cold; if the water is warm and a little ice should be thrown in to chill it, the tempering will be all the better. Pure soft water for hardening will make a tougher pick, and one less liable to crack at the edges than where salt water is used. The last hammering of a pick should always be given on the flat sides, across close to the edges and then up each side about an inch. By so doing the corners will be less liable to crack off.

It is stated that J. B. Hunt has sold his big 80-acre placer claim on the banks of Snake river to New York parties for $150,000. This is one of the flour-gold gravel claims some 30 miles west of Shoshone.

A Discovery Must Precede a Location.

The case of Upton vs. Larkin, recently decided by the Supreme Court of Montana, furnishes a fresh illustration of the losses that result from this carelessness of mine claimants.

A location was made with the discovery shaft sunk on the patented claim of another person.

The lawyers, in arguing for the validity of this claim on the ground of the lode having been found in the proper lines of the location after the error of the original discovery, relied upon an instruction of Judge Sawyer, in another case, in these words: "If a party should make a location in all other respects regular, and in accordance with the laws and the rules, regulations and customs in force at the place at the time, upon a supposed vein, before discovering the true vein or lode, and should do sufficient work to hold the claim, and after such location should discover the vein or lode within the limits of the claim located, before any other party had acquired any rights therein from the date of his discovery, his claim would be good to the limits of his claim, and the location valid." But Chief Justice Wade, of Montana, decided that "this instruction, if it is the law, would be applicable to a case where a person enters upon the public mineral land and discovers what he supposes to be a vein or lode and makes a location by virtue of such discovery before he has discovered the true vein or lode, and subsequently, and before any other person has acquired any rights, makes such discovery. Such a case would differ in many respects from the one under consideration. In this case, the appellants, without any right or authority, and as mere trespassers, entered upon the Shannon mining claim, which had been patented and was held and owned as private property. * * * and sunk a shaft within the boundaries of such claim. * * * The question is whether such a location becomes valid by the subsequent discovery of a vein or lode within the limits of the claim located." It is decided emphatically that it would not. "The statute does not permit a location and then a discovery, but in all cases the discovery must precede the location. We cannot do away with the express language of the statute and hold that there may be a valid location of a mining claim before there has been a discovery on the claim located. And especially we cannot maintain a location made by virtue of a shaft sunk on the patented claim of another person. If, subsequently to the location of the Camanche claim, a discovery was made thereon, then was the time to have made a valid location of the claim.

Antimony Mines.

The antimony mines which are being developed by the citizens of Los Angeles are thus mentioned in the Ventura *Free Press:* The antimony mines, situated about 60 miles from Ventura, in Ventura county, are being worked at the present time with considerable success. They are on the north slope of the San Emidia mountain five miles from the summit. Our informant, who has just visited the spot, says a mill is in the course of construction and will soon be in working order. The mill is located in San Emidia canyon, and about two miles from the mines. The trail is steep and zigzag, but when reached there seems to be a mountain of ore represented by short tunnels at different levels, and showing ore everywhere. In some parts of the mine the ore assays 150 ounces of silver per ton. About this mine hangs a mystery that nothing but the future can reveal. It has been rumored for many years that somewhere in the San Emidia mountains is an old mine worked by the Mission Fathers, but its whereabouts has been so completely concealed that it has never been rediscovered. A Santa Barbara gentleman told our informant that a relative of his as far back as 1854 went into the mountains with a party of men, accompanied by an old Indian who was to take them to the lost mine which was reported very rich, but after many adventures the search proved a failure. It is not unlikely that this antimony mine was worked by the early Fathers.

THE NEW RIVER ROUTE.—We notice that correspondents writing to papers below from Weaverville are endeavoring to boom up the route to New River from that place, promising to subscribe quite largely toward building a pack trail. The route from this county is over an old trail of early days, costing only $70 to improve by cutting out the brush grown, and has been traveled for two months past by parties desiring to visit the new Eldorado, and also by pack trains in furnishing supplies in the way of farm products and general merchandise.—*Yreka Journal.*

CUSTOM ORE.—Superintendent Clark of the Moulton company says that at no time since the Moulton mill was built has there been such an abundance of ore offered for custom treatment. The Moulton ore house is full, and still it rolls in faster than the stamps can crush it. The prospects north and east of Walkerville are all showing up finely, and producing more or less of high-grade ore. The coming season promises to be marked by an unusual production of ore from hitherto unworked prospects.—*Butte Inter-Mountain.*

MECHANICAL PROGRESS.

Economy in the Use of High-Pressure Steam.

The importance of the use of high-pressure steam, says W. B. Van, in a paper read before the Franklin Institute, Feb. 18, 1885, cannot be too constantly urged upon engineers and manufacturers, and that the employment of low-pressure engines is extremely wasteful; yet clear as this is or should be to all intelligent engineers and steam users, they do not seem to recognize the truth. One may often hear an engineer boasting "I have got an extremely good engine; she is the boss and will drive the whole load with forty pounds of steam," never reflecting that, when he is using steam at only forty pounds above atmospheric pressure, in a non-condensing (high-pressure) engine, one-third of all the fuel is consumed in getting the steam up to atmospheric pressure; while if he were to use the steam at 125 pounds, only one-ninth of the fuel would be so wasted.

But few engineers stop to reflect that when they are using non-condensing engines at low pressure the loss is great, owing to the pressure of the atmosphere (about 15 pounds) being a greater percentage if a low instead of a high pressure is used.

The secret of economy in running steam-engines is chiefly due to the adoption of the highest practical pressure of steam through jacketing about the steam pipes, cylinders and steam chests, and in employing the earliest cut-off at which the engine will do its work, and as perfect a condensation of steam as possible after the engine has done that work.

"It has been proven both in practice and theory that the greater the difference between the steam pressure on the piston and the resisting forces of the condenser or atmosphere, the higher will be the mechanical efficiency of the steam—hence the necessity of employing high-pressure steam in order to obtain the fullest effect of expansion."

"In the boiler the test of economy is the quantity of water evaporated into dry steam for each pound of coal burned. If this quantity be above eight pounds, the boiler is economical, and ten pounds is the maximum realized in the best boilers. Apart from the evaporative power of the boiler, its cost, durability and convenience for repairs are important considerations, and demand due attention."

* * * * * * *

Superheated Steam.

For some time past engineers have abandoned superheating, although its value is well understood, but this has been from the want of proper packing and lubricants. In the present advanced state of the arts the above objection to its use can now be overcome.

The advantages to be gained in the use of superheated steam cannot be over-estimated. The use of wet steam augments cylinder condensation, whereas by the use of superheated steam cylinder condensation will be reduced to a minimum, from the fact that the latter conducts heat very slowly.

[We would introduce in this connection the following item from a late number of the *London Engineer*, which says: "It seems a little remarkable that in the pursuit of economy engineers have abandoned superheating. Years ago its value was well understood, and the superheater was found in almost all ships pretending to have good engines and boilers. The conditions under which superheating can be employed are now much more favorable than they used to be. Asbestos and metallic packings are now available, which were unknown before, and mineral oils can be used as lubricants instead of the tallow, which alone was at the service of the engineer as a cylinder greaser. If we assume that 350 degrees is a safe temperature, then it follows that steam of 85 pounds with a temperature of 328 degrees might have 25 degrees or thereabouts of superheat imparted to it without the least danger. Indeed, a greater degree of superheat would do no harm, because the steam is certain to be cooled down the moment it enters a cylinder. A superheater will send dry steam into the engine, and not a mixture of steam and water. Another advantage is that superheat will tend to prevent cylinder condensation."—EDS. PRESS.]

Priming.

The worst defect a boiler can have is a disposition to prime; in other words to send water as well as steam to the engine. Whether a boiler primes much or little, the defect is serious. Priming is in conventional terms nothing more than a boiling over. The steam as it is generated, instead of escaping freely from the water, is entangled with it, and carries over in its grasp a certain portion of the fluid.

PROFITS OF GERMAN IRON-WORKS.—Some interesting facts have lately been collected by the German Ironmasters' Association concerning the financial results of the working of 102 companies engaged in the iron-making and machine-construction industries in each of the years 1879 and 1883. In the former year the net result of the operations of these companies was a profit of 1.6 per cent on the capital invested; whereas in 1883 the net profits on the same concerns amounted to 6.79 per cent on the invested capital. This shows a gain of 5.19 per cent. This gain in 1883 is all the more remarkable when examined in reference to the iron-working concerns alone, leaving out the machine-construction industries. It appears from the statistics that 50 of the latter companies, with a total capital of 268,764,000 marks, realized only sufficient in 1879 to pay an average dividend of 0.94 per cent., whereas in 1883 the profits earned allowed of an average dividend of 6.14 per cent being paid, the net profits amounting to 16,500,000 marks in the latter year, against rather over 2,500,000 marks in 1879.

Electricity in Mechanics.

Electricity is rapidly working its way into general uses. The latest addition to its uses is that of

The Working of Cranes.

A 20-ton foundry crane, says the *Electrical Review*, is operated by electricity at the works of M. Farcot, at St. Ouen, France, the crane having previously been worked by hand. The generating dynamo is at a distance of about 100 yards from the crane. At the speed of 1,550 revolutions per minute it produces a current of 13 amperes and about 350 volts. The secondary dynamo is fixed upon the crane itself, and makes 1,000 revolutions per minute, developing about four-horse power. The crane gearing itself has not been altered, and the electric machinery has been so fixed that the crane can also be worked by hand when the steam-engine is stopped. A special rheostat allows progressively-increasing resistances to be introduced up to 60 ohms, by means of which the lifting speed of the crane can be varied. A Megy brake, acting by centrifugal force, assures safety in case of accidental derangement of the machinery. When drawing large castings out of the sand, a vacuum is produced under them at the moment they begin to be lifted which may result in a very considerable increase of the load by the atmospheric pressure acting on the surface of the casting. To prevent accidents from this cause or other overloading of the crane, an arrangement has been introduced by which the circuit is interrupted when the load exceeds the prescribed limit, and, of course, the crane comes to a standstill. The crane, which can lift 20 tons, now requires only the attendance of one man, while formerly ten laborers were required to work it.

The Use of Electricity for Making Steam.

Should it ever be found practicable to generate electricity direct from the combustion of coal, says the *American Machinist*, the steam-engine would soon disappear; but till the inventions are perfected that will render the existing expensive methods of producing electricity no longer necessary, there seem to be small prospects of the dynamo supereeding the steam-engine as a motor to any remarkable extent. In connection with the struggle to improve on existing methods of obtaining power, a recent invention, patented by parties in California, is of curious interest. They do not attempt the Edison feat of making electricity direct from coal without the intervention of a steam boiler, but they propose to make steam by electricity. They propose to seal hermetically the flues of a boiler after having filled each with a coil of platinum wire, which will be in connection with a dynamo. The dynamo sends a current of electricity through the wires, which are arranged to make enough resistance to transform the electricity into heat. That, of course, will make the water boil and generate steam. It is not reported whether or not the inventors expect to make this steam drive the dynamo, and so keep the cycle going, but we fancy this is the expectation. The trouble with the application of electricity is that its ignorant friends are trying to use electricity for purposes it is conspicuously unfitted for.

MEND YOUR FILES.—Once in a while a file will get broken, even with the best of care; but, with the knocking about they are subject to, it is a mystery how any of them come out whole. Take a file the very minute you break it. Have a little bottle of muriate of zinc (zinc dissolved in muriatic acid), and wet the break with it immediately; then heat a soldering iron and tin the ends of the file. Heat the file pretty warm—not enough to start the temper, but rather too hot to hold in the hand. When well tinned and hot, press the two pieces firmly together, squeeze out nearly all the solder, and let the file cool. Trim off the joint, and, if well done, the file will break in another place next time. It will not pay to solder a file unless it is nearly new. If you let it lay a day, or, in damp weather, even an hour, after being broken, you never can mend it so it will stay. Take it the minute it snaps, and you can mend it.

PRIZE OFFERED FOR AN INVENTION.—At the third international conference of the societies of the Red Cross, held in September last, at Geneva, the Empress of Germany offered $1,000 and a gold medal as a prize for the best model of a soldier's barracks and field hospital. The delegates to the conference from this country have issued a request to American inventors to take part in the contest. The barracks must be large enough to contain twelve to fifteen. It must be easy of transportation and made with interchangeable parts and capable of being taken down and reconstructed. The designs are to be sent to Antwerp, Belgium, by Sept. 1, 1885, when a committee will decide on their respective merits.

SCIENTIFIC PROGRESS.

Bronze Statues.

Bronze statues were made two, and perhaps three thousand years ago, the earliest consisting of small plates hammered into the desired shape and fastened together by nails or rivets. After this they were cast solid and also with a core. At the present time it is the general custom to divide the statue, when of heroic size, into several sections, make a separate casting of each section, and then unite the parts by riveting, the joint so formed, owing to the increased thickness of the metal, being of greater strength than the adjoining parts.

It would be a most difficult task, says the *Scientific American*, to mention and separately describe each and every step which must be carefully quoted by the operator in casting bronze, in order that the resulting copy may be a *fac simile* of the original. Extended practice enables the founder to note all these features without necessarily appearing to devote more attention to one than another. In a certain sense the work, from the melting of the medal to the final flowing, pursues a beaten path along which are distributed certain guide marks, the absence or even the unusual appearance of any one of which quickly gives notice that all is not as it should be. It is here that we find the most apt illustration of the value of little things, since the most trivial neglect of a seemingly insignificant portion of the work may not only injure, but destroy the casting.

Casting in bronze does not consist solely in simply taking a pattern, making a mold and running in the metal; it is an art only to be acquired by long and patient toil, close study, and that most essential and spurring incentive, a fascination for the work. That success can only be achieved by this means will be understood by any one who will spend an hour in a bronze foundry and note the time and care spent in making sure that one step is perfected before the next is even approached. There is no sign of the presence of that most pernicious habit, too frequently permitted in other callings, in which a distasteful part may be slurred or left half finished, and a rush made for something more agreeable. The bitter and the sweet must receive the same attention, as both are equally dangerous when slighted.

One requisite qualification in the make-up of the bronze founder is an ability to obey orders. He receives from the sculptor a model in plaster which he is expected to reproduce in bronze; if he produces an exact counterpart, he has performed his whole duty and has strictly abided by his orders, which may be concisely expressed as "follow copy." It does not come within his province to attempt to improve upon the pattern set before him, but to reproduce it, whether full of blemishes or perfect. The artist does not expect him to improve his work.

DEVIATIONS OF THE PENDULUM IN MEXICO.—During the stay of the French Commission at Fort Loreto, in Puebla, M. Bouquet de la Grye installed in the chapel of the fort a seismograph composed of a pendulum and a multiplying balance. After freeing the observations from abnormal movements he found that the sun repelled the pendulum in the morning and evening, but at midday its influence was attractive. The vaults of the chapel, which ran from southwest to northeast, being heated at morning and evening, thrust the pendulum in a direction opposite to that of the sun; in the middle of the day the influence was reversed. In grouping the observations under lunar hours the pendulum was found to be attracted by the moon. The seismograph showed that there were frequent abnormal movements of the pendulum, there being twenty-two oscillations of the ground. The mean movements were in the direction of northwest, southeast, which is the same as that of the chain of the volcano Popocatapetl. While the oscillations were going on the inhabitants of Puebla felt but a single earthquake shock. It would be interesting to extend these observations by registering the movements of a long pendulum for a considerable period in an observatory; they would furnish valuable data respecting the movement of the earth's crust and the tidal phenomena.—*Comptes Rendus.*

ELEMENTS OF SOLAR ROTATION.—Sporer has tested his own observations by means of the result which was pointed out by Faye, that the proper movement of the sun spots in latitude can be represented by a sinusoid. The direction of the spots in the equatorial regions mainly toward the equator, while the movement toward the poles predominates in high latitudes, might be explained by supposing that the spots in the former case were on the descending branch, and in the latter on the ascending branch of the curve. This would require, however, that the spots should be hidden, for some unknown reason, behind the sun's disc when they were on the other branches of the curve. He gives various other tests, under various hypotheses, each of which involves an indeterminate condition. There was, however, one spot which remained visible during four consecutive rotations of the sun, and for which he was able completely to observe the sinusoid of the variations in latitude in all the periods. He was able to determine the sinusoid, independently of the node and of the declination, by means of the intersection of the curves with the parallels of latitude which he obtained for the first and second, as well as for the second and third periods. The sinusoid thus deduced for the three periods also satisfied the observations of the fourth.—*Comtes Rendus.*

COMPOUNDS FORMED BY CHLOROPHYL.—Chlorophyl when isolated is very soluble in alcohol as well as in benzole or in petroleum ether, but merely a mixture of yellow or colorless matters. Hence it seems that the chlorophyl is contained in envelopes insoluble in petroleum ether, but soluble in alcohol. The deep green alcohol extract of dried and powdered leaves, if refrigerated, yields an abundant deposit of yellowish or colorless matter insoluble in petroleum ether. Chlorophyl is very unstable in presence of dilute acids, or even of pure water. It is very stable in presence of bases, behaving like a true acid. Hence M. Fremy gave the name of phyllocianic acid to the green matter of leaves when freed from the accompanying yellow matters. With bases it forms definite salts; those of potassium and sodium being very soluble in water, but insoluble in absolute alcohol and in petroleum ether. The lead salt is insoluble. Chlorophyl may be found unchanged in the excretions of herbivorous animals, and even in peat.

PLANT MIGRATIONS.—Fifteen years ago there were no dandelions in central Iowa, now they are very abundant, and have been for half a dozen years. Then there were no mulleins, now there are a few. Then the low and evil-smelling *Dysodia chrysanthemoides* grew by the roadside in great abundance, now it is scarcely to be found and is replaced by the introduced "dog-fennel." Then the small fleabane (*Erigeron divaricatum*) abounded on dry soils, now it is rapidly disappearing. Then no squirrel-tail grass grew there, now it is very abundant, and has been for ten years. Then there was no hurgrass in the flora, now it is frequently found, and appears to be rapidly increasing. Both of these grasses have apparently come in from the west and northwest. Fifteen years ago the low amaranth was rather rarely found, now it is abundant and has migrated 150 miles northeastward. This plant has certainly come into the flora from the southwest within the last twenty years.

ANIMAL BAROMETERS.—There are two live barometers in Sacramento, so it is said, that have proved trustworthy, even where artificial instruments have failed. One of them is a catfish, which is kept in a water trough. No matter how clear the weather may be, this fish always, before a storm, makes it a point to swim about with his head below the water and his tail above. When the rain begins to fall he goes out of sight until the weather changes. The other is a couple of frogs under the floor of the police office, which have never yet been seen by any of the police officers, but who presage a storm several hours in advance of the barometrical indications by a series of peculiarly discordant croaks. No matter how clear and bright the night, the police officers then make it a point to prepare for a storm, and the warning has never proved in vain.

FORESTS AND TEMPERATURE.—As a result of his forest meteorological investigation Prof. Muttrich, of Berlin, has arrived at these definite conclusions: 1. The forest exercised a positive influence on the temperature of the air. 2. The daily variations of temperature were lessened by the forest, and in summer more than winter. 3. The influence of the leafy forest was in summer greater than that of the pine forest, while in winter the tempering influence of the pine forest preponderated over that of the defoliated forest. An attempt to determine the influence of the forest on the mean annual temperature led to no sure results.

SOIL covered with living herbage or with such dead vegetable matter as leaves, straw wood, dung, etc., says Prof. E. Wollny, is warmer in winter and cooler in summer than bare soil under similar conditions. The difference of temperature is greatest in summer and least in spring and autumn. Bare soil heats more quickly in spring and cools more quickly in autumn than that covered with living or dead vegetable matter. The fluctuations of temperature are much smaller in covered than in bare soil.

LIGHT CLOUDS OF THE UPPER ATMOSPHERE.—A. Badoureau supposes that in the upper regions of the atmosphere the temperature may be reduced nearly to absolute zero, and although the temperature is correspondingly reduced, he thinks it probable that carbonic acid, nitrogen and oxygen may be there condensed into clouds analogous to those which are formed by watery vapor in the lower atmosphere.—*Comptes Rendus.*

ELECTRICAL FISHES.—There are at least a dozen species of fishes having electric organs. The electric eel of South American waters is the most powerful of these creatures, growing to a length of six feet and provided with a pair of batteries containing some hundreds of minute cells copiously supplied with nerves, which exhibit phenomena the same as those produced by artificial batteries.

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Passing Events.

An encouraging sigu of the times is the fact that so many miuers are now working small claims themselves and putting them iu good shape, so that capital will take hold of them at the proper time. There are now so many places where miners can dispose of their ore or have it worked, that they are enahled to make more than expenses while developing their claims.

Another good thing is the spread of the leasing system, where miners have a personal interest in the ore they take out. Better work is done and an incentive is given which is better thau that afforded the mere wage-worker.

There is little uews from the mines of an exciting character. Our weekly summary, in other columus, gives all the enrrent news. Everywhere the men are at work, the prospectors are out in the hills, and the mills and smelters are in full blast.

The excelleut letters of our traveling representative, which describe the mines and mineral regions of New Mexico, are worthy of careful perusal, as a very good general idea may he gained from them of the condition of the miuing industry in that growing section.

FROM the pnhlished statistics, it is seen the coal trade of Great Britain for many years, with the exception of 1878, has heen one of continual progress, the average increase being something like 4,000,000 of tons per annum. The year 1884 was an exception to this, a decrease of upward of 3½ millions having taken place, as compared with 1883, which was the largest on record, being upward of 163,000,000 tons.

Locomotives.

The present American locomotive may he fairly considered an estahlished criterion of excellence. It is characterized hy accuracy and heanty of workmanship and strength, combined with flexihility and adaptahility to many difficult conditions of service—an adaptability which has given it the precedence where such conditions have to he met. Although the great demands of railroad traffic and travel in this country have ahsorbed the greater part of the product, American locomotives have been supplied to foreign countries using railroads in such numhers as to mske them an important factor in the extension of facilities of travel and communication ahroad.

The manufacture of locomotives in locomotive works is so far based upon the use of costly and partly finished materials that the additional lahor and expense involves lees than one-half the valuc of the fiual product. The iron and steel plates, steel tires, sheet hrass and iron, copper pipe, emoke and feed pipes, chilled wheels, holts, nuts, hardware, fittings, hoiler tuhes, flues and other materials, are in themselves costly products, and some of the forgings aud the steel and iron castings are often produced for the work by separate eetablishments having special facilities.

On the whole the raw material, properly speaking has its value more than trebled before it is brought into the locomotive works ae material for the manufacture. In comparing the manufacture of locomotives with the manufacture of small engines or of sewing machines, where the value of material in locomotive manufacture is doubled, in that of smallengines it is nearly trehled, and in sewing machines quadrupled; but in locomotive huilding the same movement of added value requires the employment of a considerably greater numher of artisans (at similar rates of wages) than are employed in the manufacture of small engines; principally because the prices of locomotives arc ruled hy the wholesale purchases of large railroad corporations, while the prices of small engines and machinery are ruled to a great degree by small buyers making single purchases.

In short, in the manufacture of locomotives the cost of pntting the product upon the market is reduced to a minimum, and of the same added value given in the manufactures and marketiugs about 50 per cent additional goes for the employment of artisans in locomotive-huilding, as compared with the general manufacture of steam-engines.

The composition hy weight of the various crude and finished material in a locomotive and tender weighing ahout 45 tone (net) may he stated as follows: Ahout 32 per cent pig-iron, 18 per cent bar and hammered iron, 9 per cent hoiler-iron and steel (ahout one-fifth of which is in the fire-hox), 8½ per cent steel tires, slides, springs and the like, 7 per cent wheels, 7 per cent wood for cah, tender and lagging, 5 per cent axles and connecting rods, 4 per cent flues, 3½ per cent tank iron, 2 per cent lead, tin, copper, smoke-pipe, glass, hardware and fittings, 1½ per cent bolts and nuts, 1½ cast and sheet brass, and 1 per cent sheet-iron.

Copper.

A very significaut fact in conuection with our copper interests is that the imports into England and France for the past four months have exceeded that of the same period in 1883 hy 9,355 tons, while the deliveries have decreased by 4,842 tons. Of the increased import 7,111 tons came from the United States, whereas last year stocks decreased 6,632 tons in the first four monthe in England; they have this year increased 7,568 tons in this period. The lower price of copper has influenced foreign mines as well as ours, of course. The effect of the low prices ruling for copper is seen in the reduced dividends of the three large Spanish mining companies, which are as follows: The Tharsie Company, 20% against 27½% for the year 1883; Mason and Barry, 8% against 12% for the year 1883; the Rio Tinto Company, 8% against 14% for the year 1883; the average price of har copper for 1884 heing £54 9s. 1d. per ton, against £63 5s. 10d. in 1883. The three companies shipped 615,920 tons of pyrites, against 639,009 tons in 1883. The Tharsis Company announce their intention of shipping 100,000 tous or 50 per cent more pyritee than last year, partly to compensate for the reduced value of the copper and the decline of 8s. per ton in the value of the sulphur contents. The Rio Tinto Company have also contracted for about 100,000 tons more than last year, while Messrs. Mason and Barry now ship all their copper produce in the form of precipitate. The Tharsis Company shipped 7,095 tons precipitate, against 6,717 tons in 1883, and the Rio Tinto produced altogether 12,668 tons (of 21 cwt.) fine copper, against 12,295 tons in 1883.

Last month Chili sent to England 3,606 tons of copper, while the United States sent 2,320 tons, and we also sent 1,685 tons of copper to France last month. For the first four months of the year Chili sent to England and France 31,824 tons of fine copper, against 36,666 tons in the same period last year. We sent to Liverpool and Swansea alone this year eo far 7,231 tons, as against 4,045 tons the first four months of last year.

Jamee Lewie & Son's circnlar of ores and metals (Liverpool) gives some interesting statistics for the first quarter of the year concerning copper. The imports into England for the quarter were 31,447 tons fine; the exports from England were 13,950 tons; British production, 524 tons; English home consumption, 13,845 tonr; imports of all kinds into France, 4,240 tons; English copper to France, 726 tons; French consumption of copper imported direct, 3,873 tons; English consumption and French consumption of copper imported direct and from England, 18,444 tons.

The Board of Trade returns show that America sent only 202 tons of regulus in the first quarter of last year, while this year we sent 3,206 tons of regulus. The English export of wrought and unwrought copper for the quarter was 9,084 tons (11,127 last year); yellow metal, 2,660; brass, 758 tons (1,011 last year); unwrought and part wrought (foreigu), 1,148 tons (3,049 last year). The Cornish mines only produced 524 tons of copper during the first quarter of the year.

New Miner's Pick.

James P. Davis and Juan G. Robbins, of Banner, Boise county, Idaho, have patented through the MINING AND SCIENTIFIC PRESS patent ageucy an improved form of miner's pick, so constructed that the head may he easily attached to, or detached from, the handle. Lugs are formed on the sides of the central portion of the head, so as to form dovetailed grooves or channels between them and the sides of the pick-head. At the end of the handle are two short metal straps, oue on each side, riveted on so as to project heyond the end of the handle. Upon the edges of the handle are fixed plates, having their ends just flush with the end of the pick-handle and of sufficient width to give a firm hearing against which the portion of the pick next the handle will rest when it is fixed in place. Through the head of the pick an opening is made transversely and similar openings are made through the straps on the end of the handle. When the pick-head has been elipped on hetween the straps, the edges of which are dovetailed to correspond with the grooves upon the opposite sides of the pick, it will rest upon the end plates, and the hole in the straps will coincide with the one through the head of the pick.

A key and gih are fitted into the holes in the strap and head, and when the key is driven in tight the pick will he held very firmly and rigidly to the handle. By this construction one handle may he nsed and any numher of picks of different weights may he fitted to it; also, other tools which can he ueed with snch a handle. Whenever a pick becomes dnll, it may he removed and another one put into the handle, and so on, and when several picks are ready to he eharpened they may he taken away to the blacksmith shop and sharpened and returned without carrying the handles with them.

The picks and handles all heing made interchangeahle, it will not matter what pick in particnlar a man may receive, it will always fit the handle which he has. When the picks are to he carried away or out of the mining shaft or place where they are used, they can he bnndled together in a comparatively small space and sent up in the bncket without much danger of having any of them hit some obstruction so as to knock them out. They are always very convenient for prospecting purposes, as a handle and pick can he packed up in small compass. When used in dry places there is no danger of the pick hecoming loose by the dryiug up and contractiou of the handle.

Restoration of Gold Mining in California.

We have frequently had occasion of late to speak of the improved condition and prospects of quartz mining in California. A feature of this improvement that deserves especial notice is the extent to which ore-hearing lodes of this kind are heing discovered all along the main gold helt and often in districts that hsd years ago heen densely populated and largely worked for the placer deposits they contained. Many of these districts, as in the case of New River, Washington and various other localities, had, hy reason of the surface diggings hecoming exhausted, been nearly deserted long ago, and so remained until a year or two since, when these new quartz finds gradually repopulated them, some containing now several thousand inhahitants.

But not in all cases have the sites of these new finds been confined to the dead or decaying camps. On the elopee of the Sierra Buttes, a notahle peak in the central part of Sierra county, and where quartz operatione have heen carried on actively and successfully for a great many years, a number of valuahle auriferous lodes have lately heen found, the most noted of these consisting of the Alaska, Phœnix, Colomho, Marguerite and the Young America, the latter onc a most promising gold-hearing vein. The Sierra Buttes mine, owned hy an English company, has heen worked continuously and profitahly for 29 years. To their 90 stamps now running this company will add 20 more in the course of another month. The Alaska, Colombo and Marguerite have each heen outfitted with a 20-stamp mill; a mill will also he put up on the Phœnix as eoon as the ditch to supply water-power is completed. The 10-stamp mill on the Young America will be increased to 20 the coming summer. The vien in this mine occurs in a belt of metamorphic slate lying at the line of contact between greenstone and syenite, which form the country. Embedded in thie helt and ruuning with it is a quartz lode having an average thickness of ten feet, which, from exteneive working tests made, it is expected will yield under the stamps $125 per ton; it heing, furthermore, calculated that 16,000 tons of this ore have been developed in the mine, whioh is owned hy three or four individuals, a once prominent Comstock superintendent having also an indirect interest in the property.

With such discoveries as these being made in much prospected and even long worked localities as well as in old aud once populous, but now partially deeerted districts, what may we not expect will yet he hrought to light in those extensive sections of the California gold fields that yet remain sparsely populated, and, comparatively speaking, have not heen much explored? The undeveloped, not to say undiscovered, auriferous resources of this State are undoubtedly very great—greater hy far than has generally heen eupposed, if not greater than the most sanguine have ever dreamed of. In view of this fact it is not at all etrange that gold mining is again coming to the front, nor would it be at all surprising if California should hefore the lapse of many years recover much of her lost prestige as a gold-producing country.

Mines of New Mexico.

Elsewhere in this issne is our traveliug representative's letters and notes on the Carlisle, Malone and other districts of Grant county, New Mexico. His observations ehow a decided improvement in mining and milling in the new as well as the old districts of that Territory. It is gratifying to note the intelligence shown and business-like methods exhihited day hy day as those who are engaged in the search of precions metals become more and more practical in the working of mines and less inclined to do their work on the stockhoard, as heretofore. Should the mining interests continue to improve in as legitimate a manner for a twelvemonth longer, we wonld not he surprised to find money loanere investing in mines in preference to real estate. The mines of New Mexico are bnt a few of those that are getting down to business; throughout the Coast the good work goes on, and ere long ore will have to be of a mighty low grade to defy handling at a profit. Next week our representative will give our readers a hudget of valnahle informaticn on the the copper mines of Graham connty, Arizona.

Manufacture of Soda.

Developments in England, and particularly on the continent of Europe, show that the new method of the manufacture of soda, namely, the ammonia process, is rapidly displacing the old. It is particularly advantageous to this country, where we have but one mine where rock-salt is mined, namely, at New Iberia, La., while there are many localities where brine of various degrees of strength up to that of cold saturation is obtained in large quantities. We have, moreover, plenty of fuel in close proximity to most of the mine centers. We have a constantly increasing demand for soda, which is almost entirely supplied by importation.

In 1875 of the total product of the world only 10.57 per cent was made by the ammonia process, while in 1883 23 per cent was made that way. This rapid increase must be credited to the enterprising firms of Brunner, Mond & Co., near Norwich, England, E. Solvay, at Couillet, Belgium, and Varangeville, Dombasle, France, all working according to the Solvay plan. The first increased their production to 52,000 in 1883 from 2,500 tons in 1875; the second, from 179 tons in 1867, to 4,678 in 1875 and to 65,125 in 1883.

During the last few years extensive experiments have been made, to furnish a new source of ammonia by utilizing the waste products from coke-ovens and iron-furnaces. These have already been crowned to some extent with success. Large coke-producers have erected plants to collect the ammonia at remunerative prices. Considering the very large amount of coke produced, it is evident that no fear need be entertained but that a constant supply of ammonia can be secured at reasonable rates from the above source. Ammonia-soda-works, which may be so favorably situated as to have their coal supplies near at hand (and such places are fortunately found, particularly in the United States, in close proximity to salt-brine), may even find it advantageous to produce their own ammonia and supply the waste at minimum cost.

While we are indebted to E. Solvay for having opened the path to success (the enormous increase of his personal manufacture in Europe, amounting to 179 tons in 1866, but 53,400 tons in 1882, being ample proof), other able practical chemists have entered the field also, so that we have now a variety of apparatus, described in foreign journals, as used in Europe to accomplish the same object. It is due to M. Solvay that the first manufacture of this kind has finally been erected in the United States, at Syracuse, N. Y.

These facts we take from a paper by Oswald J. Heinrich, of Drifton, Pa., read before the American Institute of Mining Engineers. To make clear the peculiar advantages of this process, Mr. Heinrich gives in Figs. 1 and 2 of the engraving a sketch of works designed to use the apparatus of M. Gerstenhoefer, patented in the United States May 3, 1881.

Fig. 1 represents the ground plan, its exterior dimensions being 218 by 50 feet, including a mill and packing-room at the lower end, not represented in the figure. Fig. 2 is a longitudinal section. The design represents one "block," which is the smallest works which can be put up to make the manufacture profitable. For larger works the blocks are grouped together, and by the centralization of the work expenditures in erection and general manage-

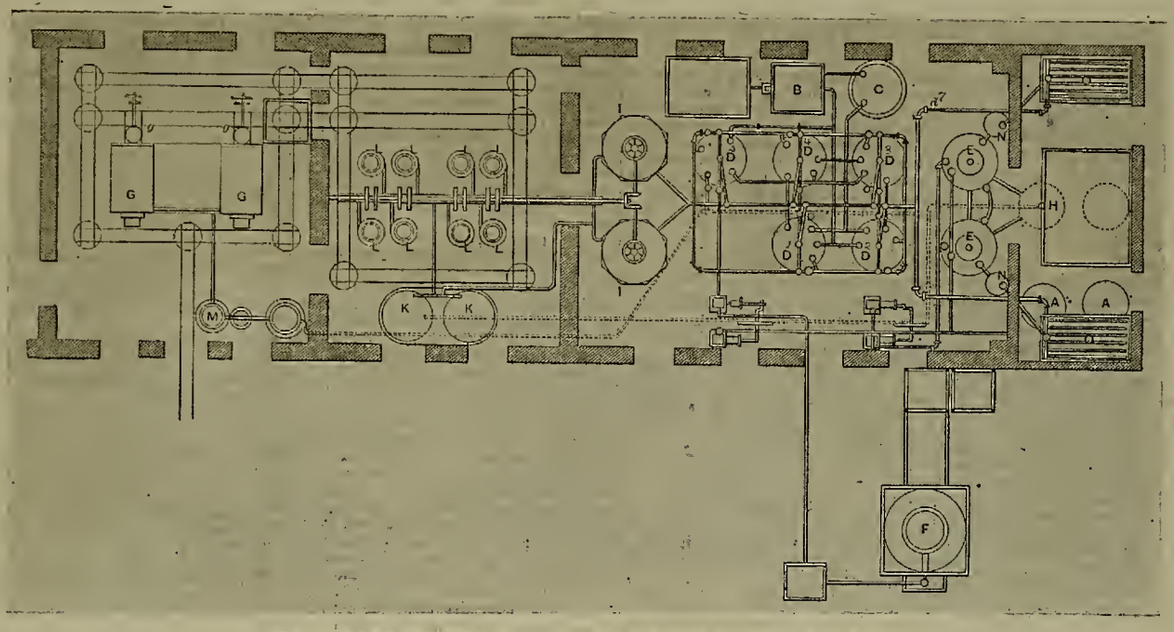

Fig. 1.—GERSTENHOFER AMMONIA-SODA PLANT, GROUND PLAN.

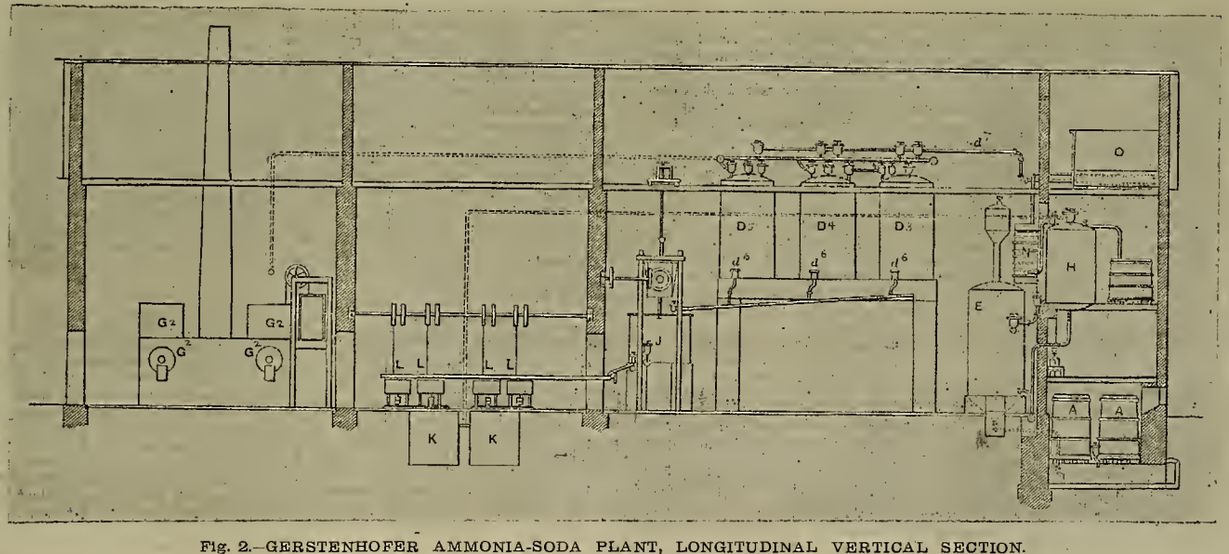

Fig. 2.—GERSTENHOFER AMMONIA-SODA PLANT, LONGITUDINAL VERTICAL SECTION.

ment will be reduced. One block is capable of producing eight and a quarter tons in twenty-four hours. A block consists of five separate departments. In the first we find the brine tank, A, from which the purified brine is forced over to a coke-tower, B, supplied with a shower apparatus. The wasted ammonia gas, if any should leave the next apparatus, passing upward in this tower, is absorbed entirely by the descending brine. The latter is collected in a reservoir, C, and pumped into the universal apparatus, D, for conversion into bicarbonate of soda. Five of them are used in rotation, as described below. Each consists of an air-tight cylindrical sheet-iron vessel, D. It is supplied with a three-way pipe, the top branch of which passes through the center to the bottom of the cylinder and connects there with a wider cylinder. The latter is supplied with a large number of perforated pipes for the distribution of the gasses.

The converters, D_1, D_2, as well as the ammonia stills, E, and agitators, I, are all placed in the second or converter department.

The apparatus D_1, D_2, etc., operates in successive periods, thus:

1. Cylinder D_1, being charged with brine, receives ammonia gas and sufficient carbonic acid gas to form monocarbonate of ammonia. Cylinders D_2 and D_3 meanwhile act as absorbers of waste gases, being also charged with brine, which has already taken up some of the waste gases. D_4 contains fresh brine.

2. D_1 receives now the remaining carbonic acid gas necessary to produce bicarbonate of ammonia, and, by reaction upon the brine, bicarbonate of soda and chloride of ammonia. Meanwhile, D_2 receives ammonia gas, and D_3 and D_4 act as absorbers.

3. The first cylinder, D_1, is emptied and cleaned out by means of a steam-pipe, while the reaction and absorption take place in the succeeding apparatus.

4. D_3 receives its balance of carbonic acid gas, while D_1 is charged again with fresh brine, ending the rotation of the appparatus.

From the converters, the contents are discharged by a line of pipes into the agitators, I, of a peculiar construction and closed air-tight. Their purpose is to incorporate the materials still further. Each converter can be brought into communication independently with the brine-pump, the ammonia-still, the lime-kiln, F, the calcining apparatus, G, or the agitator, I. From the agitator the product is transported to the centrifugal machines, L, in the third or separating department. Here, by means of centrifugal force, the chloride of ammonia liquor is separated from the precipitated bicarbonate of soda, to a maximum degree. The liquor is collected in closed tanks and forced through a line of pipes to the primary heater, H, in which bicarbonate of ammonia, to some extent mixed with the chloride, is first expelled. Now, the chloride of ammonia in the still, E, is converted, by means of caustic lime, into ammonia gas, which is rectified and dephlegmated in suitable apparatus, N and O, whence the ammonia-gas reenters the converters D_1, etc., to be used again.

The contents of the centrifugal machines are transported to the calcining cylinders, G, in the fourth department. They are supplied with proper stirring and transporting tools, attached to a rotary shaft. The cylinders being heated, the small amount of ammonia chloride and half of the carbonic acid is expelled, to enter always the first of the converters in the respective circuit, while anhydrous monocarbonate of 99 per cent purity remains in the calcining cylinder. This is transported into a fifth department, the mill-room, and received by the soda-mill, pulverized and packed into barrels ready for shipment.

All vessels and connections being air-tight, so far as a good manufacturer can effect it, the loss of ammonia is prevented. By means of splitting the operation, and first producing monocarbonate of ammonia, the evolution of heat is reduced, the temperature in the converters being further decreased to its minimum by means of refrigerating coils placed within them.

All transportation of brine and gases being effected by pumps or compressor, the chemical reactions are controlled as near as it can be done within the converters. The brine entering the first will leave the last department six hours afterward in the form of anhydrous monocarbonate, ready for packing and almost pure chemically. To persons familiar with the manufacture of soda by the Lehlanc process, it must be evident that the ammonia-soda process requires less manual labor, and that of a less skillful nature, while, at the same time, the raw material, brine, is converted into a marketable product in a minimum period of time.

Mr. Heinrich gives in his paper data which prove that for a like investment of capital a Lehlanc plant for making soda would yield $36.05 profit per day, while the ammonia-soda plant would yield a daily profit of $195.52.

In regard to localities in the United States we find rock-salt in the States of New York, Virginia, Louisiana, Texas, Nevada and Oregon; strong brine in New York, Virginia and Michigan; weaker brines in the central basin of the United States, Ohio, West Virginia, Kentucky, Pennsylvania, Mississippi, Missouri, Illinois, Indiana, Kansas and Arkansas. It is particularly those weaker brines in the central basin, with cheap fuel close at hand, which would furnish a favorable opportunity for the ammonia-soda process, where the Leblanc process would find it difficult to meet the higher price of solid salt.

New Mexico.

Carlisle Mining District.

[From our Traveling Representative.]

The town of Carlisle is situated in the mountain range running east and west a distance of 18 miles east from Duncan, Arizona, a station on the A. & N. M. R. R., between Lordsburg, N. M., and Clifton, Arizona. The new comer cannot hut express surprise at the extensive mining operations going on in the camp and its immediate vicinity. Large and substantial buildings, mills, reductions works, great shaft-houses, boarding-houses, assay offices and laboratories give the place a Virginia City sort of an appearance that makes the observer's surprise an agreeable one.

The Carlisle Mine.

This mine is the property of the Chicago millionaire Fairbanks, and one or two of his friends. It is a fissure and is worked after the style of and by an old Comstock superintendent. Col. I. E. James has charge of the property. The ore body showed four feet between walls near the surface and widened out to 20 a few feet lower, and has held that width with surprising regularity down to the 400-foot level. The quartz is a gold-bearing, low-grade ore carrying considerable copper, lead and iron. Occasional streaks of black galena occur throughout the vein matter, this galena running much higher than the regular ore body. The ore runs from $10 to $35 per ton.

Ore Treatment.

The rebellious nature of the output of the Carlisle has been a source of annoyance and expense to the owners for a number of years. Only within the past few weeks has the management had any assurance of being able to realize on all of the mine's output. The ores are run from the mine directly into a 20-stamp mill. The passage of the ores through the mill is automatic; the process being battery and plate amalgamation by which about one-half of the value of the ores are saved; the other half to be realized on from treating the concentrates. Eight Duncans and a like number of Frue vans are used. The concentrates are piled up and a number of years' accumulation now waits the reduction process now about to start up. It is estimated that the value of the concentrates now on hand is over $200,000.

Underground Workings.

A three-compartment shaft goes down perpendicular on the vein over 400 feet. There are four sets of floors from the 160-foot level up toward the surface. These floors are seven feet in the clear and extend some 300 feet in length on the vein, being from wall to wall in width which averaged 20 feet. A 500-foot drift both ways from the shaft on the 300 level exposes the ore body as firm and regular as the upper floors have done. A large box tank receives the water from this level and also that from the lower level; the latter by a pump, which is again pumped into tanks above the mill and used therein. On the 400-foot level a tunnel has been run to determine the extent of the ore body at that depth and a similar condition of affairs to those found above was the result. An 8x16 tank four feet deep receives the drainage on this level and is pumped into the tank on the 300 level above. No dead work needs to be done for years in this property, as it has been planned and worked systematically and with a view of learning what could be shown up before an extensive output was attempted. The output at present with a force of less than 45 men under ground is 45 tons per day. This can be increased to over 1,000 tons when so desired. As the mill is but a 20-stamp there is no necessity to take out more ore than it is able to treat.

The Reduction Works.

The capacity of the reduction works is ten tons per day, the process being about as follows: Concentrates are dried in a revolving furnace with about 15 per cent salt; then roasted in a revolving furnace and ground six hours in pans, the pan charges being one and a half tons with 400 pounds quick, the product being a base bullion consisting of silver, lead and copper, the latter predominating. The smelting of these concentrates was found to be impracticable, owing to the scarcity of water and the cost of fuel. The Leixivation process tried on these ores showed a saving of five per cent more silver than any other.

Carlisle Reductions.

Miners are paid $3.50 per day. Board is $7 per week.

There is a tri-weekly stage line between Duncan and Carlisle. Fare, $3 up and $2.50 down.

There are two towns of Carlisle, old town and new town. The population of both are about equal.

West Camp, near Carlisle, has a fine showing of prospects that bid fair to prove up mines by development.

The irrepressible boot maker, Otter Johnson, of Lordsburg, is to be found in almost every camp in the Territory. He has a branch establishment at this place.

The recent killing of a miner by a boarding-house boss for talking about the latter's wife has had a dampening effect on village gossiping on the affairs of the sex.

An addition of 20 stamps to the Carlisle mill is talked of. Such an improvement would enable the treatment of all the low-grade ore and make the whole product one of less cost.

George James has charge of the mill and reduction works of the Carlisle. He is a young man, bright and experienced in mineralogy and metallurgy. The success of the treatment of the Carlisle concentrates is largely due to his progressive and untiring efforts.

No water is to be had except that pumped from the Carlisle mine. The supply thus obtained is but a little over one-third enough to run the machinery and the mill. By tanking, pumping back and reusing the water a sufficient supply is obtained. Wood has to be hauled some distance, and the cost is $6 per cord.

The Pilgrim mine just east of the Carlisle mine is opening up with every indication of being another Carlisle. Depth and a little capital will determine its worth as a mine. The owners, Messrs. Walls and T. J. Levy, are poor men and unable to push the property as it should be done. These men are progressive and would more than likely give an interest in the mine for capital to develop it.

East Camp.

Directly east of Carlisle is what is known as East Camp. The mines of this camp cover miles of ground. The ores are argentiferous quartz, also gold-bearing formations in variety and richness to suit the most skeptical. With but few exceptions the development of property in this camp has shown the output to be less in dollars and cents than the expenditures. The miners are a hard-working set of men whose only drawback to future wealth is a lack of capital to develop their property. The whole country is apparently stratified with numerous mineral-bearing vein matter. No depth to speak of has been reached on any of the mines. The output of a number of mines has returned excellent showings from shipments, but not sufficient to justify mining men to take hold of and push the work of extensive development.

The recent discovery of free gold in sandstone has caused the location of everything that resembles sandstone in the country for miles about. Time and a further testing of this sandstone find will demonstrate the value of the discovery.

East Camp "Concentrates."

Water is scarce.

Wood is not very plentiful.

The Nugget has abandoned work after an expenditure of $8,000.

The usual cry of "we want a mill" prevails here to an alarming extent.

Assessment work is the most of the development now going on in camp.

Dr. Davenport, of Lordsburg, has built a fine 20x40 house, and moved his family out to East camp.

The Rain-in-the-Face and a number of other mines have shipped some ore that made good returns.

Henry Harris, a Lordsburg merchant prince, has a number of good locations in East camp that promise well for developing into future bonanzas.

The discovery of gold in so many different formations in a number of New Mexico districts show that gold is like an Apache Indian in many respects, especially so in often being found where least expected.

East camp will either "boom" or "bust" this season. A number of capitalists and mining experts have visited and inspected its mines, and their investment will prove its worth or their non-investment its failure. F. W. S.

The Malone District, N. M.

[From Our Traveling Representative.]

This district lies some twenty miles northerly from Lordsburg, on the Southern Pacific. The town of Malone is situated at the mouth of Thompson's canyon. A small stream from a never-failing spring supplies the camp with water. Wood is abundant close by, and is as cheap as it is plentiful. Few mining districts enjoy the advantages that Malone does in the way of location, resources and in being a peculiarly desirable place to live. The people of the camp are of the pioneer coast class, that are noted for their cordiality to the stranger and their unbounded faith in mining in general, and Malone district in particular. The place should have been named Faithville, on account of the strong and wonderful faith exhibited by the miners of the camp in the ultimate success of the district.

The Mineral Belt.

Like nearly every mining district of the Territory, this has mineral-bearing formations peculiar to itself. For a distance of nearly three miles the course of a great contact is marked across the western slope of a spur of the Burro mountains, known as the Carlisle range, by the parapets of a porphyry dyke. These parapets range from northwest to southeast in a line directly between the district of Carlisle on the northwest and the Gold Hill on the southeast. The lead is a quartz lying on a granite wall varying in width from 12 to 40 feet. On the hanging wall between the wall and the quartz is a talc gouge, averaging about three feet in thickness, that is highly mineralized, assaying very high in silver. The quartz ore body carries both gold and silver, the latter, however, predominating. Although not of a high grade, it is of such value that the milling of it, if done by a mill on the ground, would be a lasting and paying proposition. It is a free-milling ore carrying chloride, sulphide and horn silver, native silver in a number of instances having been found in the ore.

Fine Prospects.

As yet there are no mines in the district. It must be remembered that a colt is not a horse until he has age and experience, even if he is larger in bone and muscle than the tried and reliable horse beside him. As for prospects, there are many, some of them being exceptionally good and rapidly approaching the dignity of a mine in every sense of the word. Unfortunately, the ownership of the best prospects are in the hands of poor men whose capital consists largely of muscle and experience, and whose valuation of their possessions would ruin them if assessable at their figures of rating their value. The work already done on the various properties is primitive in style and in keeping with the capital of these persevering, hard-working miners. Development so far has opened up what is beyond a doubt a number of future bonanzas. The defective mining laws of the Territory allowe a man to hold any number of mines on a ledge or contact, provided the claims do not adjoin. Thus one man could own every other claim in a district. The bad effects of this law are noticeable here. Big prices have been the mine owner's schedule heretofore. At present, however, capital can get a foothold in the camp at reasonable figures, and an investigation of the merits of the mines is almost certain to result favorable to an investment.

The Young Man.

The fame of the Young Man mine in this part of the Territory is nearly equal to that of the Old Man mine, fully described in a previous issue of the PRESS. For the development made the mine has produced more money and done less dead-work than any property in this part of New Mexico. Located most advantageously on the side-hill, easy of access by an excellent wagon road, the claim has paid from the very float of the croppings from the contact. The discovery of rich deposits of ore in a number of feeders to the contact resulted in the entire development work being done on those feeders, pushing the work toward the contact with highly satisfactory results. A 90-foot shaft in the gulch some 300 feet from the contact shows the wall of a slide running toward the contact at a right angle. A tunnel driven in on this wall 50 feet below the surface opened up excellent deposits of mineral in the silica and sedimentary formations. In the breast of this tunnel an extensive body of manganese is widening out into a chamber-like deposit. This ore runs 25 ounces in silver and carries some gold. The pay streak at the end of this tunnel is nearly 20 feet in width. A little to the south of this shaft is some 100 feet of drifting in a body of silica, between porphyry and syenite. Deposits of chloride and green horn silver occur throughout the silica which itself is more or less mineralized. Three other shafts, the deepest being about 60 feet is all the development work as yet on the mine. These shafts show a more solid formation, the ore bodies being a quartz. The pay streak averaging from 12 to 20 feet assaying regularly in such a manner as to average 25 ounces in silver and nearly $10 in gold. So far the ore of this mine has carried nearly enough gold to pay the expense of mining and milling. Out of less than 450 feet of actual development and dead-work the shipments have resulted in the production of over $12,000 in bullion.

Making a Mine.

The Young Man if developed by capital and labor-saving machinery would, inside of 60 days, be a bullion producing mine that would astonish even an enthusiastic Maloneite (and they are hard to astonish), and pay its management handsome dividends. The great bulk of low-grade ores that cannot be shipped at a profit would pay for a mill, and could be kept running steadily for months on the many ore dumps of the district. A more desirable property for a company of capital and practical mining sense is not to be found in this part of Grant county.

The Malone Group.

Judge J. B. Malone and T. E. Brown own the above group consisting of the Tenderfoot, Montana and Sitting Bull. The former shows the most development work done. The formations are similar to the Young Man mine, the group being a continuation of the contact with but one or two claims intervening. Only about 75 feet of work has been done on the Tenderfoot. A number of shipments, several cars in all, have been made from this group. The pay streak averages about 14 inches in width assaying as high as $200. The shipments averaged $168. These claims as well as the Young Man have paid more than the expenses of working them.

Telegraph Communications.

Messrs. Birt and Beatty, of Lordsburg, completed the erection of a telegraph line between Malone and Lordsburg, on April 24th. The putting in of this line at this time speaks volumes in behalf of the stability of the camp. While they are a little premature in establishing this desirable and convenient enterprise, yet their so doing will result in a more rapid advance in the future of the entire district. A camp that shows up sufficient to justify the early erection of 23 miles of a telegraph line is certainly deserving of the attention of men who are seeking investment in legitimate mining.

Malone Briefs.

The Novelty is working on a lease.

A force of about 20 men is at work on the Young Man.

A tri-weekly stage between Lordsburg and Malone is managed by D. M. Potter. Fare, $2.

The number of claims bonded by parties looking for good property is encouraging to the camp.

The crack bootmaker of the county, Otter Johnson, of Lordsburg, will open a branch store at Malone.

The road from Lordsburg to Malone has no equal in the Territory for both pleasure and serviceable driving.

The MINING AND SCIENTIFIC PRESS has the largest circulation of any paper coming into the Malone district.

O. R. Smythe, one of Lordburg's most enterprising and progressive citizens, is largely interested in this district.

G. C. Warner, one of the owners of the Young Man mine, has a general merchandise store at Malone city.

The murder of Judge Macomas and his wife by the Apaches in '83 occurred almost within sight of Malone city.

The Malone group is pushing development with a good force. A recent shipment of 1,840 pounds of ore netted $273.

An old-time Californian, in the person of N. P. Mikesell, formerly of Auburn, is one of the owners of the Young Man mine.

The Malpais lies 600 feet north of the Young Man and is down 30 feet on ore. Dorsey & Conway are owners of this fine prospect.

The Dove and Cowboy adjoin the Young Man on the north. The former has considerable development on and shows good ore in places.

L. Beatty, an enterprising go-head Lordsburger, has opened a butcher shop in Malone to "meat" the wants of this rapidly growing camp.

Law and order abiding citizens is the class of mining and business men of Malone. The place lacks the customary presence of the blackleg and gamblers.

Water in goodly quantities can be brought from Thompson's canyon in pipes, so as to cover the town and enable a mill to be supplied but a short distance from the mines.

California capital has been solicited to examine the Young Man mine. The purchase of that excellent property by a California company would be the making of Malone as a mining camp.

The Malone operator, Major R. L. Nellis, late of Chicago, has imbibed the faith from the old timers, and if there is anything the district won't produce in the way of mineral the Major has not heard of it.

The Malapise is being worked by E. A. Anderson on a lease. Considerable ore has been taken out of the 30-foot shaft now down on the upper edge of the contact. A shipment will be made of this ore during the present week.

The only danger to Malone's future prosperity and its reputation as a substantial district, is the weekly "Boom Budget," announced by a four-page dodger hard by. Men who are watching mining districts with a view to purchase do not notice the indiscriminate publications of hummer correspondents or the announcements of amateur advertisers, who don't know the difference between sand carbonates and native copper. This making of a fine mining camp should be careful ere it is too late, and not allow irresponsible men to send communications to would-be papers of like standing.

F. W. S.

GLOBE DISTRICT.—The Arizona *Silver Belt* says: Our prediction that more silver claims would be worked in Globe district this season than ever before is already verified, although only two weeks have elapsed since we made the statement. There is now a strong probability that the Old Dominion Company will soon resume and the temporary suspension will prove a benefit to the camp instead of an injury, as many feared. A great many men who have begun chloriding will stay at it if they can make wages, and from present indications it is pretty certain that most of the claims being worked will pay well. Should the Old Dominion resume, there will be an influx of new men and we will have the liveliest camp in Arizona. During the past week a number of leases have been made and work begun on a good many claims.

PLACER MINES. — Rich placer mines have been discovered on Skull creek, a few miles above Willow creek. The gold is coarse and pure, and is found in paying quantities where water can be had for ground sluicing. Joel Bradshaw, of Paradise, who has a claim in the new diggings, has a vial of the "dust." This year the water is scarce in the diggings, though last year, before it was known that gold existed there, water was abundant in the creek.—*Silver State.*

AMALGAMATED IRON-WORKERS.—At a meeting of representatives of iron trades unions held last week, an amalgamation of the iron-moldere, pattern makere, blackemiths, machinists, boilermakers and amalgamated engineers was agreed upon, and the following were elected as permanent officers: President, J. B. Johnson; vice-president, Stephen Gunn; recording secretary, John Mahoney; financial secretary, Joseph Valentine; treasurer, Joseph Turner.

The placer miners of Shasta county will now hang up their picks and shovels for the summer.

Engineering Notes.

Compressed Air Power.

At Guinnesec Falls, Michigan, the water-power is used to compress air, which is conducted through a 24-inch pipe to the iron mines, a distance of three miles, where it is used for operating pumps, engines and drills in place of steam. The head of water at the falls is 47 feet and drives three turbine water-wheels, each of which operates a pair of air compressors, and the whole plant has been in satisfactory operation for over a year. One of the earliest instances of the application of air on an extensive scale in the operation of drills was, says *Engineering*, in the excavation of the railway tunnel, 28,081 feet in length, which pierces Hoosac mountain, situated in western Massachusetts, where a rapid river at the eastern terminus furnished the water power which was used to compress air which actuated the drills, while the exhaust served to ventilate the tunnel. Several years ago the manager of the cordage works at Plymouth, Massachusetts, introduced an air locomotive which took the place of some sixteen horses and an equal number of men employed in transporting material from one department of the establishment to another.

The risk of fire prevented the use of a steam locomotive in these ropewalks and mills. The air passes from the reservoir, which takes the place of a boiler, through a reducing valve into a receiver, where the pressure is maintained at 90 pounds per square inch. Thence to the cylinders, where it is used like steam, except that the refrigeration produced by the expansion of the air is so great that it is necessary to use very limpid oil for lubrication on such places. The compressed air is furnished from a receiver of boiler-iron, which supplies a system of underground pipes with hydrants at convenient places, and when the air supply at the locomotive is becoming low it is stopped near one of these hydrants and a hose with a snap coupling attached, and the air supply replenished with little delay. At one of the fairs of the Charitable Mechanics' Association, in Boston, the management forbade any fires in the building, and as a consequence the exhibitors of portable engines considered that they were deprived of opportunities of showing the operation of their class of engines. One exhibitor showed resources equal to the occasion, for he connected the exhaust pipe of one engine in his exhibit to the boiler of another of his engines, removed the safety valve and connected the fly-wheel by belting to the shaft which was kept in motion by the main engine of the exhibition. This method of driving an engine furnished a supply of compressed air into the second boiler, whence it was used for motive purposes. Soon the manager learned that these portable engines were in operation, and, assuming that the regulations concerning fire were necessarily violated, sent a worthy colored messenger to examine and report the facts to him. After looking these engines over very carefully he reported that they were running the engines in question with the "northwest wind or something or other." A group of laborers were examining the engine, and one of them gave his opinion that "cold steam and no fire was the greatest invention yet."

The Cape Cod Canal.—Work on this important undertaking is still progressing. The great dredge, which is doing the excavating work, has passed quite a distance inland from Cape Cod bay, and is now floating in the elongated basin which it has prepared for itself and where it is still cutting its way, slowly but surely, to the marshes at the head of Buzzard's bay. It lifts its load of mud or sand some 56 feet high, drops it into a proper receptacle, from whence, in the form of fluid mud, it is conveyed by pipes 300 or 1,000 feet away, as the need may be. The canal is just now being run through, or in the neighborhood of, a locality made famous years ago as the favorite trout fishing grounds of Daniel Webster and his legal friend, Sidney Bartlett. It passes near "Swift's old tavern," which, if it had a voice, could tell many an interesting story of the brave cheer and merry-making of those two famous fishermen of the ancient days, when railroads had hardly been thought of, and when stage coaches were the only means of public conveyance by which those old nestors and their "Boston friends" could reach this famous region for fishing sport or a clam-bake.

A Monster Steamer.—The steamship Etrasia, a sister ship of the Umbria, built by John Elder & Co., for the Cunard line, has just left the Clyde on her maiden trip to New York. She is built of steel, 520 feet long, 57½ broad, 41 deep, 8,000 tons burden with engines of 12,500 indicated horse-power.

Even for the naval cadetships there is an overwhelming rush. The President has three vacancies to fill, for which there were 140 candidates, and several hundred applications for cadet appointments have been made since.

The Board of Supervisors of Sutter county have ordered a bridge to be built across the tules on the road from Yuba city to Meridian, at a point known as the "Stone Road," at a cost of $15,000.

Useful Information.

Rust Cement.

One of the most adhesive and durable of cements known to mechanics who essay to unite iron surfaces is the oxide of iron itself; with this a joint can be made so perfect and sound that the iron will break before the cement will part. In removing the cast-iron pipe of a bilge pump from a ship that had made four Atlantic voyages, it was necessary to take the sections apart. The flanges had been pasted with a cement of cast-iron drillings and filings, mixed with sulphur and sal ammoniac, moistened with water. Then the nuts—three in each flange—were set upon the bolts, and the union was completed. The four voyages—going and returning—occupied nearly a year. When the separation of the parts was attempted, even the cold chisel was unable to make a division between the solid castings and the intervening cements. The sulphur and ammoniacal salts are simply means to more rapidly oxidize the iron drillings and filings—the iron rust is really the cement. If time is allowed, ordinary water or salt water would act as a solvent.

All our iron ores are simply oxides, and when they are exposed to the atmosphere they show the ordinary color of iron oxide—red. This oxide gives the red color to the "brownstone" (red sandstone) so much affected for building purposes. These stones are only sand cohered in mass by iron rust. Their formation can be witnessed even now on some of the New England beaches. The narrow and slightly raised windrows of sand thrown up by some heavy storm or some very high tide, so that they are beyond the reach of the every-day effects of common tides and ordinary winds, can be noticed slowly solidifying. Fragments may be gathered which are only sand slightly held by the oxide, but others may be found which are embryo stone—if such a term may be allowed—solid to the feeling, and capable of being thrown as missiles. Beyond these are the shingles of the beach and the cliffs that define the shores. In olden time this sand and this iron was mixed, subjected to pressure by outerlying layers, and at length became "solid rock," as we call it. And yet this quarried rock of sand cemented with iron is still somewhat soft, and for building purposes requires seasoning—the gradual reabsorption of the water given by the atmosphere and this water is essentially salt, or it has the oxidizing effect of salt water, for its effect on iron is similar to that of salt water on the iron under similar circumstances.

It is evident that any substance that induces rust in iron is not a safe one to use in connection with permanent structures of iron. Some years ago an instance of iron in connection with red sandstone — brownstone—was noticed, where wrought-iron rods were secured into steps of brownstone. The stairway was removed, and the iron in the stone was disintegrated into mere threads. In this instance the holding of the iron balusters was sulphur. And sulphur is much worse than lead; it is impossible to secure iron in stone, or even in iron by sulphur. Lead is perhaps as safe as any material that is not too expensive to use. In removing an iron fence the embedment of the palings in lead lining the holes in the stones, making a superficies of about fourteen inches, was readily overcome by lever action, while the cross-section of the same paling through iron rails, iron on iron, the area being less than three and a half inches, necessitated the use of hammer and cold chisel.—*Scientific American.*

Mother-of-Pearl Designs on Tissues.—A German has patented a design in Germany for producing mother-of-pearl designs on cloth by the following method: A thin layer of caoutchouc is spread over a thin copper plate, on which the design is cut. The cloth is spread over the plate and a hot roller passed over it. By the heat the caoutchouc layer becomes liquid, and by the pressure it adheres to the cloth on which the required design is thus obtained. The cloth is now covered with powdered mother-of-pearl, which is spread evenly by means of a hot roller, and the excess of mother-of-pearl which does not stick to the cloth is taken away by means of a soft brush. The cloth is now covered with very fine crepe which has been wetted in gum water, and after drying the crepe can be made fast on the cloth so as to protect the mother-of-pearl powder from falling off, while owing to its fineness and transparency it does not spoil the brilliance of the powder.

It has been asserted that the quality of tea may be approximately estimated by the weight of ash which it yields, the value of tea being inversely proportional to the ash. M. Nikatinski has lately, says the *Grocer*, made a series of experiments, with the view of testing the truth of this assertion, and finds that the ash is a very fair index of the quality of the tea. Thus, a good Shanghai tea gave 5.16 per cent ash, a cheap green brick tea 6.87, and two Orenburg teas, which are known to be adulterated with rose leaves, and of which the price was 115s. and 48s. per cwt., yielded respectively 7.87 and 10.42 per cent of ash.

Rolled Gold is thus manufactured: An ingot of brass is cast, and while it is yet hot a thin layer of gold alloy is poured upon it. When the ingot thus covered becomes cold it is forced between steel rollers until a long thin ribbon is produced, of which the proportion of gold and brass is, of course, the same as that of the ingot. The percentage of gold is often reduced very low—sometimes to two and three per cent. This rolled gold in cheap bracelets and watch chains lasts for 10 years.

A Fruitful Grain.—A grain of wheat sown by the wind grew without cultivation in the midst of a meadow at Chatillon-sur-Chalaronne. On cutting the hay the tuft was left undisturbed and allowed to ripen. At harvest time it was found that the single grain had produced 53 stalks, 43 of which bore fine heads, yielding a total harvest of 1,563 grains.—*Les Mondes.*

Tuning forks and grindstones are now made of glass. Rails and sleepers are manufactured from the same transparent material. The new process is a simple one, and produces hard-glass castings at a cost of $1.32 a cwt. If iron does not reform its oxydizing habit it may be replaced by this temperate and attractive rival.

As Carrier Pigeons in China are often molested by birds of prey, an ingenious plan for protection is employed. Ten small bamboo tubes are attached to the bird's tail by means of threads passing under the wings. The hasty flight of the bird produces a whistling sound, and this keeps birds of prey at a safe distance.

Ancient Shields.—In the Tower of London are 21 specimens of shields, with a pistol attachment in the center, the weapon being a breech-loader, and slightly projecting, so that it would hardly be noticed by an enemy until it was discharged. All these shields were carried in former times as "concealed weapons."

In Bees the crop is called the honey bag. The gizzard is found in insects having mandibles, and is frequently lined with rows of horny teeth, which are especially developed in grasshoppers, crickets and locusts. Insects have no true liver, but its functions are performed by little cell masses on the inside of the stomach.

The Largest Gun yet made is being constructed at Woolwich arsenal. It will weigh 200 tons; measure 43 feet 8 inches in length and 5 feet 6 inches in diameter at the largest part, and have a 16-inch bore.

Good Health.

Healing by Faith.

It is not our purpose, says the *London Lancet*, to deny, or even question, the verity of "cures by faith." The "mind" so acts on the body, and the brain plays so important a part in the nervous system, by which the whole organism is energized and controlled both in regard to its functions and nutrition, that it is not only quite possible, but an absolute fact, that many maladies which are not so far advanced as to be dependent upon changes in structure, or "organic diseases," may be remedied by or through the agency of the mind. We will even go so far as to affirm that a very large proportion of the ailing might be, and probably would be, sound if only they were sufficiently strongly impressed to believe themselves to be so. This influence of the mind on the body has been the stronghold of quackery from the earliest times, and "faith" is as powerful an influence for good or evil now as it has ever been. Such "miracles" as the Salvationists are working with their presage among the emotional classes, whether illiterate or well-informed, have uniformly signalized the commencement of a new era in religious enthusiasm. When the first enthusiasm subsides, "miracles" cease of physico-mental necessity. The large class of so-called hysterical, cataleptic, and even epileptic affections, are distinctly amenable to this influence; so are those nervous disturbances and derangements which consist wholly or chiefly in disorderly activity, as distinguished from actual disease. The mimetic maladies, of which there are always a very large number of cases, are, of course, amenable to the curative influence of faith. Outside these classes, however, stand a multitude of badly-managed or misunderstood cases which only need to be placed on a new footing—it matters little what—to get well. A wondrous crowd of ignorant prejudices still hovers over many districts as to the curability or hopelessness of special diseases which are better understood and more successfully treated—on common sense principles—in the centers of knowledge.

For example, we know of localities and affections which, being associated, produce the most dire delusion as to the length of time hones usually take to unite in healthy subjects; and how coughs and other distressing maladies are, or are not, under the control of the will. In such combinations of facts and fiction, it is easy to get miracles out of such common matters as the union of the accurately applied ends of a fractured radius in three or four days! There is not a word to be said against "healing by faith." Every busy practitioner has cases under his observation that he would be heartily glad to find so powerfully affected that they could be cured even by this agency. All we are anxious to point out is that an intelligent lay press ought not to lend itself to the promulgation of nonsensical beliefs and impressions. Of course, it is true that many of the poor people who are reported to be "cured" are actually benefited, and by their faith. This is a fact, and there is no sort of reason why the benefits received should not be permanent. If the subjects of these cures are thankful to the Giver of all good, that is not a matter to make merry about. It is as it should be. We are glad of their gain, and pleased to find them moved to gratitude. Meanwhile if these "cures" need be discussed, let the comments made be neither irreverent, offensive, nor puerile. The *modus operandi* of such recoveries is perfectly well understood, and there is nothing either specially noteworthy or wonderful about them.

Hours for Sleep.—The latest authority on the vexed question of sleep, Dr. Malins, says that the proper amount of sleep to be taken by a man is eight hours. So far as regards city life the estimate is probably correct. Proverbial wisdom does not apply to modern conditions of social existence. "Five (hours) for a man, seven for a woman and nine for a pig," says one proverb; and a second quoted by Mr. Hazlitt in his English Proverbs, declares that "Nature requires five; custom gives (allows—?) seven; laziness takes nine and wickedness eleven." These conclusions were, however, drawn from observation of country life. Physical fatigue is more easily overcome than intellectual. Men, however, who follow any intellectual pursuit are exceptionally fortunate if the processes of restoration occupy less than seven hours. More frequently they extend to eight or nine hours. Kant, I see it stated, took never less than seven hours. Goethe owned to requiring nine. Soldiers and sailors, on the other hand, like laborers, do with a less quantity.

Death Traps.—The American *Cabinet Maker* contains a few short remarks on "death traps" that deserve to be copied over and over again in every technical journal. "There is not a mill or shop in the United States," says our contemporary, "but what contains some death trap which needs boxing up. Steam engines are bad enough, but they are harmless compared with set screws projecting from collars, bolts from couplings or belts running unprotected upon pulleys in or near passage-ways. The law orders these things to be protected. They are safe enough; it is the people that want protection, and the machinery is free trade in this respect. It is a pretty sure thing that if a man gets killed in a factory the owner thereof has to pay for it, but it does not seem to make owners any more careful to weed out and cover up the danger holes in our shops and factories." How many establishments are there in the United States where the above would not find an application somewhere?

Drowning not Painful.—A good deal has been written as to what the sensations of people are supposed to be who are drowned. The *Nautical Magazine* for March relates how a little girl who was thrown into the Thames, at Kew, by her nurse, explains the matter to a jury in her own simple way: "I sank till I felt my feet touch the bottom, and then I fell asleep till I found myself wrapped up in a blanket in the boat house." She added: "There was no pain beyond the first shock of the water." It may thus be gathered that death from drowning is by no means a painful one.

Disinfectants.—A true disinfectant will kill the germ in which the contagious principle resides; mere deodorization is of no avail. Carbolic acid is effective in destroying germs—turpentine is a good disiofectant of some odors. It is thought that gas-lights and mineral-oil lamps act as disinfectants from the gases they throw off. Professor De Chaumont says "there is but one true disinfectant, and that is fire." So we can burn up germs sometimes, and when fire can not do the work of destruction carbolic acid may be called in to help.

Camphor and Cholera.—At a recent meeting of the Homeopathic Medical Society of New York several physicians read papers on cholera, and all spoke highly of camphor as a remedy. One doctor said that during a certain cholera epidemic in Europe 2,000 people, each of whom wore a small bag containing camphor about their necks, escaped, although exposed to the disease, while others died by the hundreds. Pure water, good ventilation, regular and correct habits, and wholesome surroundings are the best preventives known.

Rain water.—That rain-water is more wholesome than hard water for drinking purposes is correct in the main. Ordinary cistern water is unfit for use; it should be purified by filtering. Hard water may abound in earthy or mineral matters and be very injurious, notwithstanding it may be comparatively pleasant to the taste.

The Magnet in Disease.—The use of the magnet for the cure of diseases was known to the ancients. It was known to Aetius, who lived as early as the year 500. He says: "We are assured that those who are troubled with gout in their hands or their feet, or with convulsions, find relief when they hold a magnet."

To Disguise the Taste of Paraldehyde.—Sutter finds that rum and tincture of lemon combined with paraldehyde make it palatable.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

MAHONEY.—Amador *Ledger*, June 16: This mine resumed operations Monday morning, under the superintendency of Morris Brinn, with Jos. Savage as underground foreman. Six men are employed in cutting a station at the 600-foot level, from which point it is expected that sufficient ore will be taken to start the mill shortly. Mr. Brinn informs us that he has purchased or leased one-half interest in the property, with one year's time in which to pay the money. In the meantime the mine will be judiciously handled, the rock carefully sorted if necessary, and every effort made to put it on a paying basis. Morris Brinn is a careful and shrewd business manager, Mr. Savage is a No. 1 practical miner, and if it is within the bounds of possibility to make the Mahoney a remunerative mine, we expect it will be accomplished under the existing regime.

SUTTER CREEK.—The familiar sound of the Mahoney whistle was heard for the first time in many months on Monday morning. It turns out that parties in this county have taken the property in hand, just who I am not prepared to say; but the proposed plan upon which the mine is to be worked is far from satisfactory to those needing employment. The proposition is to guarantee one-half the wages in cash—$1.25 or $1.50 per day as the case may be, and the payment of the balance will be contingent upon the mine paying. If it fails to pay the men will lose one-half their wages. Already some difficulty is experienced in getting men on these terms. The contractors engaged in sinking the shaft at the Voorheis claim are encountering some difficulty with water. They have to bale it out until Mr. Voorheis gets back from the city, when he will no doubt put in a small pump.

AMADOR QUEEN.—The erection of the 20-stamp mill on this mine in Hunt's gulch is making rapid headway; some 15 men are employed about the work. The mortars that were sent up were found to be unsuited and had to be returned. The four new mortars are expected up this week. Three Duncan concentrators have been received, the only concentrators of this make in the county. They are intended for test purposes, and if satisfactory 12 more will be put in making 15 in all. Mr. Shugert went below Monday morning to look after the mortars and other matters pertaining to the mill.

Calaveras.

ANOTHER RICH STRIKE.—Calaveras *Chronicle*, May 16: It was but a short time since that we recorded the finding of some very rich rock in the Tiger mine, near Rich Gulch, owned by Mr. C. Schlund, our local banker. One day last week the men who were engaged in sinking a shaft on the vein struck a "pocket" of unexampled richness, the specimens found being the handsomest we ever saw. The gold was actually chiseled from the quartz. It was literally a vein of pure gold running through the rock. A quantity of large flakes of gold were picked out with only a small particle of rock clinging thereto, while others were absolutely free from rock and nothing but the pure metal. Four flour sacks full of quartz and gold were chiseled out of the vein. The shaft in which this rich find was made is between 70 and 80 feet deep, and about 400 feet distant from the prospect shaft in which the former strike was made. The extent of this rich "pocket" is not known. This was left to be revealed later, while sinking is being continued for new developments. "Played-out Calaveras," as some are pleased to call it, will yet prove that it isn't yet so badly "played out," and that its wealth in gold is far from being exhausted.

El Dorado.

TUNNEL.—Georgetown *Gazette*, May 15: Sam Watson and Jos. Swazey completed their tunnel last week in their seam-pocket mine south of town, running up an incline to their shaft, and having placed in a line of sluice boxes are now drifting on the seams. They merit much success. Will Gibbs is one of the force.

ECLIPSE.—Placerville *Observer*, May 16: W. M. Keefer has taken a bond on the Eclipse mine, near Jayhawk, and has arranged with the Gray mill to crush 100 tons of ore, fifty tons of which is now on the dump, and the balance easy of access. Twenty tons of rock from this mine was worked some time ago, and went $8 to the ton. H. P. McNevins and P. J. O'Connor, of San Francisco, came up on Thursday last, and proceeded over to the Darling mine, on Bear creek, returning on Friday. Mr. O'Connor has taken the bond on the mine held by McNevins, and let a contract to run the tunnel fifty feet further, and is negotiating for hoisting works for the purpose of sinking below the tunnel.

THE GREENSTONE.—Mountain *Democrat*, May 16: A *Democrat* reporter visited this group of mines last Monday, and reports developments as actively progressing on nearly every mine on the belt. At the Florence, owned by Tuck & Son, a new double compartment shaft is being sunk, which has already attained a depth of 40 feet. It is intended to sink to a depth of 110 feet, at which depth it is expected to tap the ledge. Since our last report from this mine a new Huntington mill has been erected, and the owners express themselves as delighted with its work. At the Barns mine, 1,000 feet north of the Florence, a new prospecting shaft is being sunk 250 feet north of the old works. The shaft is now down about 50 feet. Work has been resumed at the Eureka, owned by Graham Bros. This was formerly the Bonanza mine of the belt, and the owners feel confident that it will yet distance its former record. Crane & Elliott are busily engaged freeing the deeper workings of this mine from water, when work will be actively resumed in the lower levels. The present promises to be a lively summer on the Greenstone, and one we hope will be prolific of big strikes.

Inyo.

BROWN MONSTER.—Inyo *Independent*, May 16: Yesterday a shipment of 10 tons of ore was made to San Francisco. About 30 tons more are on the dump but shipment is delayed for want of sacks. Mr. Stirk came up from San Francisco to the Maxim mill about the begining of the week, to assist in putting the new concentrators in operation. Before he got there, however, Mr. Stansfield had already got the machinery in thorough working order, and was doing good work. The ore is reduced in the proportion of about ten tons to three, or two and a half. Peter Laird was prospecting a claim adjoining Freeman and Coates, near Bishop creek. He ran a cut about 45 feet deep on the ledge, but has suspended all further operations for the present. Mr. Laird will soon resume work on a mine in the Inyo mountains, where he has already done a good deal of prospecting, and with very satisfactory results. Sam Piper was over at Big Pine last Wednesday from Fish Lake valley. He brought over some samples of ore containing native silver that would run up into the thousands of dollars per ton. Two men who are prospecting a claim at the White Hill got out six tons of ore during the month of April, that will net them $450. In addition to getting out this amount of ore, the men did dead work during at least 10 days of the time.

Mariposa.

THE DILTZ.—Cor. Mariposa *Gazette*, May 16: We have lately been digging away the debris and rocks from over the Rickard shaft, which was brought there by a land-slide during the rains of '84. As the shaft was previously covered over with timber it was prevented from getting filled up; but as it is, the vein shows within a few feet of the bottom, which is 120 feet west of the hanging wall, and does not, at this point, show a smooth or regular foot wall; but by its being full of strata of quartz and red ocher, proves that it is all vein matter on the westerly side of the hanging wall. The vein and matter shows on the surface which has been sluiced and cleared away over 20 feet wide. This is the most northerly shaft and will have to be sunk 216 feet more to strike the lower level which is started in from below the spring on the Sherlock gulch side of the hill and which tunnel or level will have to be driven about 600 feet. I have also sunk down on the fissure a few feet, say 15 or 20 above the spring, which has cut the water off from it. All the vein on this side of the hill necessarily lies deep under an old land-slide, and the gold from it originally went down into the Sherlock gulch below. The whole width of the vein on the south side of the hill shows now to be 110 feet and getting wider as it goes down and contains gold all through. I can now get ore and vein matter to be tested from any shaft or open cut on the mine. Respectfully yours, JOHN S. DILTZ.

Nevada.

WASHINGTON DISTRICT.—Cor. Nevada *Transcript*, May 13: The IXL quartz mine at the head of Diamond creek, which was closed down about a month ago, is to be started up again in a few days. The Hunken boys, John and Nick, have a very fine prospect in quartz lying just to the north of the Eagle Bird, of which it is supposed to be the southern extension. The ledge is from three to four feet wide, full of sulphurets and galena, and shows rich in free gold. There are a number of good looking ledges on Diamond creek, but none of them have been much developed as yet. John Dill is still on his pins and doing well. Omega has had new life infused into its veins quite recently by the starting up of new mines close by. Ferguson & Co. are putting up a 20-stamp mill in the immediate vicinity and one or two other mines are to be started at once.

Plumas.

THE BULLION COPPER MINE.—Greenville *Bulletin*, May 13: From Mr. A. J. Ford we learn that work on the above mine has been resumed by Walter Ford and A. E. Torrey. He says that the prospects are good as progress is made. The lode is well defined and the quality of ore is improving.

OPHIR CONSOLIDATED.—Some mining men were in town the other day examining this mine. They expressed themselves as well pleased with the prospects. About 900 feet up the mountain from tunnel No. 3, a shaft is being sunk in a large ledge formation which looks very well. Mr. Hall says he is well pleased with the prospect.

GOLD STRIPE.—Mr. Standart, superintendent of this mine, informs us that work on the upraise continues. It will take about ten days to complete this, when work in the tunnel can be prosecuted with vigor, as the miners will have pure air to work in. The tunnel will be pushed ahead as rapidly as possible to reach the chimney worked above, which it is expected to strike by running between two and three hundred feet. The backs will be about 300 feet.

ENGLES COPPER MINE.—We learn that the prospects of this mine are still brighter. The ledge is of enormous size, being 52 feet in width and well defined. The owners have shipped some of the ore to San Francisco, and it assayed 26 per cent. If the ledge will average anything like the result of the assay the property is extremely valuable. Work has been progressing since the mine was last spoken of in the columns of the *Bulletin*. A road about four miles in length leading to the property is nearly completed. It is expected that reduction works will be erected during the summer. We understand that capitalists are becoming interested in the mine, and that little doubt is entertained that Plumas will soon have a large copper mine in successful operation.

THE MAY FLOWER.—*Herald*, May 16: P. Crary, who came down from Forest Hill a few days ago, informs us that the sights at the May Flower mine reminds the old Californian of the days of '49. They are down in this mine, Mr. Crary thinks, to the main channel of the divide, and the quantities of big chunks of coarse gold they are taking out not only gladden the heart but help the eyes. This big channel struck in the May Flower is supposed to extend from near Forest Hill to above the Secret House, a distance of some 20 miles. If this theory is correct, and few miners now familiar with the location doubt it, there is more money yet on that divide than was ever taken from the Comstock, and it can be secured with less expense than was necessary on the Comstock mines.

MOHAWK NOTES.—Plumas *National*, May 16: Chamberlain & Flint have been crushing quartz from their mine, in the Hapgood mill, and the first three day's run they had a fine prospect, but on the fourth day they found to their dismay, that some mean, low, contemptible person or persons had put kerosene oil on all their quartz and all through the mill, consequently no test could be made, as they could not save the gold. They have more men at work in the tunnel, which is in 40 feet now, and at 60 feet they expect to tap the ledge, then we will look for lively times. Business seems better in this part of the county now than it has been for a long time. Messrs. Johns, James and Hoskin were in this part of the valley yesterday looking at the mines. There are several men here from Reno and other places looking after mining interests.

Shasta.

PROSPECTING.—Shasta county *Democrat*, May 13: About 50 miners, mostly new-comers, are prospecting in the Buckeye district, we are told. Good reports continue to come from Copper City. The new milling enterprise is working successfully and in every way satisfactorily to the company. Two rich quartz strikes of gold and silver were recently made near Oregon Gulch. Ore from one of these claims assays $1,900 in gold and one-half ounce in silver. During the past week about ten locations have been made on the belt in which Dan O'Neal's Florida mine is situated. The locations are all south of the Florida, and several of them are fine prospects. The Spencer mine at Sunny Hill has a 140-foot tunnel and a shaft 170 feet in depth on the ledge. The lead is 9 feet wide and averages $30 per ton. A San Francisco company is negotiating for the purchase of this fine property. Barney Spencer, Harry Burke and O. P. Woodward have struck a fine prospect near French Gulch. It is an extension of the Mad Ox. The vein is 10 or 12 feet wide and the ore carries free gold and a big percentage of high-grade sulphurets. Mr. Flagg, a mining man and member of a San Francisco mining company, is negotiating for the purchase of the Florida mine, Dan O'Neal's property, for $20,000, and has been given 25 days' time to make up his mind whether he will take it or not. Ed. Reid and company are building roads and erecting an ore and mill house, and as soon as these preparations are completed will put up a 5-stamp quartz mill on their mine, which is situated about one mile north of Dan O'Neal's claim. This property is already quite well developed, and they have several hundred tons of rich ore on the dump. George Banghart is working a quartz ledge on shares on Sugarloaf mountain, this side of Centerville, that is about as rich as anything yet found in the county. The vein varies from a few inches to three feet and pays from $10 to $60 to the pan. Where the vein is smallest the rock is richest. Three or four shafts have been started, but the deepest is only 12 feet. Lowrey, the boss pocket hunter, owns the property. Tom Harrison has struck it rich. The new strike is on the south end of one of the leads near his house. Last week he started in to run a cut across the vein preparatory to running in a drift, where he intended to take out quartz to crush in an arastra. During the first day's work he struck a body of ore that will pay from 25 cents to $1 to the pound. We are informed that he was offered $500 a ton for five tons of ore that is in sight.

Sierra.

THE FOUR HILLS MINE.—Sierra *Tribune*, May 14: It is reported that large quantities of good paying ore is being extracted at the Four Hills mine. The mill is running to its full capacity. Sierra county is full of such mines. All that is needed is a little money, the open sesame, to develop their richness. This mine remained idle for years, awaiting the touch of the magician's wand (capital) to bring its immense treasures to the surface to enrich its owners. Under the judicious management of Mr. Reynolds, it is paying handsome monthly dividends. Jesse Carney came down from Poker flat this week and reported that the quartz crusher, recently erected at the Belmont claim, would have to be moved to another place, as the foundation was caving away. This is an unfortunate occurrence, as the mill was already to start up.

COLOMBO MINE.—For several days past it has been freely circulated about the streets of this town that the ledge had been encountered in the lower tunnel at the Colombo mine. From all information that the *Tribune* reporter could gather without a visit to the mine, it is a foregone conclusion that the long sought for ledge has been found. The latest information at hand concerning the strike was that they had run four feet into the vein and were not yet through it, also that gold was found in the rock. An additional force of men have been put to work at the mine, and the ledge in the lower tunnel continues to improve.

BELMONT CON.—*Mt. Messenger*, May 16: The Belmont Consolidated quartz mine is located above Poker Flat, on a spur of the mountain leading up to Mount Filmore, as we understand the situation. The new rotary mill, for which Robt. Forbes has the right, was started last week, and proved a complete success, crushing rock rapidly for so small and cheap a machine, and requiring but little power to run it. Ten inches of water, under a 125-foot head, furnishes ample power with a three-foot Pelton wheel. The shaft is now down 70 feet, all the way in rich rock. There is a tunnel now within about 20 feet of the bottom of the shaft, and a connection will soon be made, and rock for crushing furnished through this outlet. The ledge itself is some 40 feet wide, but the rich streak will average perhaps four feet. The ledge has been located many times, and at one time an arastra was put up on it and run for some time, but when cleaned up, neither gold nor quicksilver could be found. The rich rock carries a large percentage of arsenical sulphurets and heavy pyrites, which almost precludes the possibility of working it successfully in an arastra. The new mill, however, seems to be especially adapted to successfully work this character of rock, in that it bids fair to be an excellent amalgamator in the battery, and in giving the pyrites no opportunity to "bed" on the bottom. When the mill had been running a short time it was discovered that leakage from the pipe was causing the ground on which the mill stood to soften and the mill to settle, it having been erected on an ancient slip, although this was not apparent until the ground became saturated with water. The delay will be but trifling, as the machinery was all taken down and removed to a solid cement foundation about 200 feet down the hill, in a day and a half. At the new location there will be about 30 feet more head to the water, which in time will be of great advantage in working the mine and will more than compensate for the slight cost of removal. Properly fed, the mill will crush about five tons a day. It is of course but a prospecting mill; but it appears to be far ahead of any arastra, when all things are considered, both as to efficiency, cheapness and portability.

Trinity.

CRUSHING.—Trinity *Journal*, May 16: P. A. Lefren & Co., owners of the North Star quartz mine in the East fork mining district will start Saturday to crush rock in their new mill, the New Patent Crusher. They have got good rock, a good mill and consequently the North Star boys will produce the bullion.

QUICK TRIP.—Two young men came through from New River this week in good time. They left White Rock after breakfast and walked to North fork for supper, carrying their baggage—about 40 pounds each—with them. All agree that the trip from Weaverville to the New River mines can be made in one day on horseback, and one old mountaineer offers to bet that he can walk it in one day over the new trail. The same man tells us it always took him three days to walk from the mines to Eureka.

Tuolumne

SHUT DOWN.—*Union Democrat*, May 16: The Hyde mine shut down a few days ago, but for what reason could not be ascertained. It is said that some disagreement among those managing the property is the cause of the stoppage, and it is also said that the works will be started up again in a few days. Any permanent cessation of work just now, when the property is in a fair way to be developed, is to be regretted. The mine has not been worked enough to make any test of it whatever. It was rumored around town Thursday that they had struck it rich again in the Bonanza mine. Mr. Divoll said, on being interrogated, that if any strike had been made it was "in here" (pulling out a handful of 20-dollar pieces from his pocket). He knew nothing of any strike. He said they were not working where they expected to get gold, but were running a drift to tap a large body of water. "Whenever I ask a man if he's getting gold," said he, "I know he will lie," and we have no reason to doubt Mr. Divoll's word.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, May 16: During the past week the big hydraulic pump has steadily reduced the flood, until, within the last 24 hours, it has subdued it to its former condition, below the 3,000 level. No further breakages of the pumping arrangements have occurred, but preventive measures adopted preclude any further danger from that source. Some tightening and packing of flange connections are being made; also, repairs to the large air compressor, which furnishes the requisite supply of air to the lower levels, the recently submerged drifts have to be cleaned out and put in order again, and to-morrow, or by the first of the week, full work will be resumed on both the 2,900 and 3,000 levels, going ahead with the very promising ore developments at these points, it being two weeks ago Sunday next since this work was interrupted by the breakage of the pump and consequent flooding of the mining depths.

CON. CALIFORNIA AND VIRGINIA.—On the 1,750 level the main lateral drift south is being pushed as fast as the bad nature of the ground will admit. The ore stopes on this level are looking and yielding well, about 40 tons per day being the average extraction. The old ore stopes of the bonanza section, between the 1,550 and 1,200 levels, worked under the Jones lease, are also showing and holding out well. The new gallows frame near the old Consolidated Virginia shaft was raised into position yesterday, and next in order will be the repairs to the sbaft.

OPHIR.—The upraise from the 500 level, to connect with and drain the old Mexican sbaft, is making good progress. As heretofore remarked, all the waste from the explorations of the Mexican and Union Companies, on thier 500 level, and also that of the 1,500 level explorations of the Consolidated California-Virginia Company, is all hoisted through the Ophir sbaft.

ALTA.—Some pretty good spots and streaks of ore have been found in the last few days in the prospecting work about the 950 level. Work was to have been abandoned at that point but for this. The ore is being saved for future reference.

CROWN POINT.—Extracting the low-grade bonanza leavings from the old workings progresses actively, as usual, with no new features of importance to relate.

OVERMAN.—The low-grade ore extraction from the 226 level through the old Petaluma-street tunnel goes ahead prosperously, about 12 or 15 tons being the daily yield.

MEXICAN.—The joint Union and Mexican drift, running north on the 500 level, continues its good rate of advance, about 50 feet per week.

BELCHER.—Nothing new beyond the regular extraction of low-grade ore from the old upper levels, through the Crown Point mine.

GOULD AND CURRY.—The main lateral drift south toward the Savage is being pushed forward at the rate of 50 feet a week.

YELLOW JACKET.—The extraction of ore from the old upper levels goes ahead as usual, with no new points to mention.

BEST AND BELCHER.—The northeast drift from the main north lateral drift on the 1,000 level progresses well, as usual.

KENTUCK.—The old ore stooes continue their regular yield, keeping the Rock Point mill properly supplied.

CHOLLAR.—The water being now out from the 3,000 level, prospecting work is to be resumed forthwith.

SIERRA NEVADA.—Running the main north lateral drift progresses well.

Columbus District.

MOUNT DIABLO.—Candelaria *True Fissure*, May 16: The west drift on the sixth level has advanced 12 feet during the week, and the east drift on this level is in 18 feet. The east drift on the fifth level is in 115 feet, and shows more favorable ground for ore. The winze from the west drift on the fifth level is down 97 feet, and shows a small amount of ore. The stope above this drift and the intermediate stope between the fourth and fifth levels, are both looking well. The stope on the third level and west of the shaft is giving some $80 ore from a ledge that is looking promising. The intermediate stope, between the second and third levels and west of the

shaft, shows some improvement. The intermediate, east of the shaft and between the first and second levels, is giving considerable ore from a narrow ledge. The stope, between the first and second levels and west of the shaft, is giving a small amount of ore of good grade. The west drift on the first level is giving some good ore.

Eureka District.

LOCAL NOTES.—*Sentinel*, May 15: The Eureka Star mine sent in a load of ore last Monday. The Bricktop mine continues in the list of ore-producers. The Marguerite mine is making rather large shipments of ore. The Dead Broke mine shipped to the Richmond furnaces recently 23 tons of ore. The Members mine shipped to the Richmond furnaces the other day two tons of ore. The Wega mine in Newark valley sent in two tons of ore recently to the Richmond works. Bad roads are interfering with the ore shipments from some of the neighboring mines. The Lone Pine mine on Adams Hill continues to make occasional shipments of good ore. The Silver Lick is making some good shipments of ore to the Richmond reduction works. The Dunderberg mine continues to look well, and during the past week it shipped 19 tons of ore of good quality. The Colorado mine on Prospect mountain, close to the Silver Connor, shipped during the past week five tons of ore. Reports from the Mount Hope mines are of a very encouraging nature, and those familiar with the property look for a large production of ore this season. The Lord Byron mine, one of Eureka district's most reliable properties, continues its shipments of ore, and during the past week sent to the Richmond furnaces 46 tons. During the quarter ending March 31st, the gross yield or value of the Lord Byron was $28,227.05, and the prospects are favorable for the amount to be considerably increased during the present quarter.

Mount Cory District.

DULL.—Walker Lake *Bulletin*, May 16: Coryville is sleeping a Rip Van Winkle snooze at present, but it will soon wake up. McLaughlin and Cook have been prospecting for a rich gold ledge one and a half miles north of the Big Indian mine, but have so far been unable to find it. There is some excitement in Coon Hollow over the North Star and also over the Snow Bird tunnel, which is in 505 feet, and has struck a ledge of pretty fair rock. The Silver Brick has two men at work and looks well.

Red Canyon District.

ENCOURAGING.—Genoa *Courier*, June 16: News from Red Canyon district continues of the most encouraging character. Messrs. Bradley and Winnie a few days since brought in from that section a specimen weighing several pounds that literally glittered with the precious metal. Alex. Morrison has a quantity of rich rock, taken from his claim in the same neighborhood, in which the gold is easily discovered with the naked eye. Jack McKnight has struck another pocket, which is reported to exceed anything in richness and extent heretofore found in that locality. Altogether the prospects bid fair for a regular mining boom in that district the coming summer.

Tuscarora District.

NAVAJO.—*Times-Review*, May 16: Fair progress has been made with the work on the different levels during the past week. There is no material change to report.

NORTH BELLE ISLE.—Drift north, 150-foot level, advanced 8½ feet; total length, 190 feet. The prospects of finding ore in a short distance are very favorable.

INDEPENDENCE.—Repairs on No. 1 shaft are completed, and the upraise from the 400-foot level to connect with it has been carried up 64 feet. Drift south from cross-cut east, has been extended five feet.

BELLE ISLE.—Drift north, 450-foot level, advanced five feet, cross-cut west, 350-foot level, extended six feet. Have started a drift north on the west lateral 150-foot level. Total length from the line cross-cut, 50 feet. Have suspended work in the south drift from the west cross-cut 250 feet.

ARIZONA.

NOTES.—Clifton *Clarion*, May 16: Capt. Kelly reports the Detroit, Yavapai and Modoc bueno. Capt. Merrie says the daily output of the Longfellow is 45 tons. Mr. Wm. Bonnell last Saturday struck a rich body of gold ore on the claim recently referred to in these columns. J. H. Vaughn, at the Queen, struck a pocket of native copper Monday morning. He is shipping ore from the Queen and King mines. Prospectors hereabouts never were more encouraged than now, and look forward hopefully to the not distant day when capital will create the cheerful glow of the slag and bullion pots, giving employment to thousands instead of hundreds of the men at this camp. The Alaska is continuing to produce rich glance and oxide. Ore has been struck in the second level. The parties who are to buy this property will be here on the 20th of this month. Rails have been laid in the second level, and hereafter it will be the working tunnel of the mine. Friday was the day that the ground was broken on the Morning Star. On Friday gold was struck, and last Friday on the same mine 4 feet 6 inches of excellent gold-bearing matter was exposed on the face of a cross-cut running west. Friday seems to be the day for luck in this mine. The increased output of copper ores from the different mines feeding the Arizona Copper Company's smelters keeps two trains busy hauling it. Copper may go down in the market, but the Clifton district, from the abundant supply stored in her rugged mountains, can stand it if any other district in the world can. As development and improvements are made in the Greenlee Gold Mountain Mining District the more valuable the claims are proven to be. All that is required now are facilities to reduce the rich ores that are daily discovered in order to make Clifton one of, if not, the principal mining district in the Territory. Copper, silver and gold are here in abundance, but it will take time and money to prove it. While at the Longfellow group of mines Monday we learned that the new incline shaft is now down 80 feet. When they sink 20 feet deeper it will be down to No. 3 level where considerable new ore bodies have been uncovered. In the open cuts at the Yavapai the ore shows a good face. About 20 tons of ore are being shipped daily from the Detroit. At this latter mine prospect work is showing up well. The engine and fixtures intended for the incline tunnel have been taken to the Detroit mine, and the horse-power at the Detroit will be placed at the Longfellow incline tunnel. Capt. Harrover will superintend the erection of the machinery. The Captain, after completing the work, intends to go North on a visit. He had intended to go last week, having left the employ of the company, but was requested to stay and place the hoisting works. It looks strange to an observant American that foreign capital is all that is invested in this region to any considerable amount. The Arizona Copper Company, a Scotch syndicate, built the railroad from Lordsburg to Clifton, and the 20-inch gauge road from Clifton to their numerous mines, besides miles of incline railroads, which climb the sides of precipitous mountains where mines have been opened. Yet, with one exception, Americans have not ventured to invest any capital to speak of in this section.

MOJAVE MINES.—*Miner*, June 17: The latest strike on Stockton Hill was made by Wm. Engle on the old Franklin mine, and with a few days' work he has exposed to view one of the richest bodies of ore on the hill. J. M. Gale made quite a shipment of ore from the Moonbeam mine, at Stockton, a few days since. Beecher & Co's teams took back to Kingman yesterday 44 sacks of ore from the Quick Relief mine; and also about five tons from one of Frank Smith's claims, near Cerbat. We have seen some beautiful specimens of ore from the Sunlight mine during the past week. The specimens are covered with native silver in every form and are equal to any we have seen taken from the Lone Star, which has hitherto been considered the specimen mine of the district. The Sunlight mine lies about halfway between Mineral Park and Chloride and is owned by John Barry. Kimble Bros. have quite a force of men at work on the Signal mine on the celebrated McCracken ledge, near Signal. Beecher & Co's teams came into Kingman early last week with seven tons of ore from the Hibernia mine, in Cedar district, the property of Supervisor Raymond. Messrs. Maxson and Jackman shipped a carload of ore last week to the Pueblo Works from the Primrosa mine, in Todd basin. D. W. Grant shipped five tons or ore last week from the Schenectady mine, at Chloride to the Pueblo works. Geo. Mendez has bought one of Steve Smith's claims near Chloride, and has gone to work on it already. He expects to put a number of men at work during the coming summer.

COLORADO.

IDAHO SPRINGS.—*News*, May 15: That grand old treasure vault, Seaton mountain, is turning out more ore than ever before in its history. Ore wagons are constantly passing through our streets, loaded with ore for the samplers, mills, smelters and railroads. Alex. Taylor, an old-time mill man and miner of Gilpin county, will have charge of the stamp-mill here for the Lilly Company. The trains on the railroad are taxed to their utmost daily in bringing up supplies—coal and machinery. Double-headers on most of the trains. Peter McFarlane, the boss builder of Colorado, was over Monday and will commence the erection of Colonel Osbiston's smelter. If capitalists wish to see how mining is conducted and made to pay large profits, let them come to Idaho Springs and remain a few days, visiting our mines, mills and smelters. A double-cylinder hoisting engine arrived this week for the Gum Tree mine. The boiler was hauled to the mine and put in position, and in a week or two work will be pushed upon this excellent property. The Champion-Donaldson mill is running night and day upon the free gold ores of those mines. The returns are very satisfactory and are gaining steadily in value. We understand a strike of excellent ore has been made in the bottom of the Champion mine, on Bellevue mountain. This is one of the largest and best mines in the county, and all it requires is thorough exploring. We understand there will be a consolidation of several properties owned by Colonel Osbiston and his associates, which will comprise several large paying mines, together with a stamp and buddle-mill and smelter. The whole thing will probably be organized into a company, at a very reasonable capitalization, according to the value of the properties. This will be good news to Idaho Springs and will be the means of bringing a large amount of capital to invest in our mines. We shall speak of this more fully later.

SAN MIGUEL BRIEFS.—*Journal*, May 16: The Cimarron will soon commence shipping. John Donnellan has resumed work on the Mendota. The mines of Marshall basin can do but little until the trails are open. Ore houses and dumps are filled and there remains no place to store the ore. Ernest Warner is working his contract on the Smuggler. W. A. Koneman is thinking of erecting a mill at Trout Lake for the reduction of the ores of that district. The Boomerang continues to improve with every foot of development. Monday work was commenced on the Caribou trail shoveling out the snow and opening up trails for burro trains. Work was resumed on the mine Thursday. The Ophir stamp-mill has commenced pounding away on Osceola ore again this week. A portion of the force have resumed work on the mine under lease of Lawsha Bros. It is estimated on good authority that the Silver Bell mine near Ophir, has $12,000 worth of ore on the dump. Frank Morgensen well deserves his handsome pile of wealth. Charles Ward and Steve Gifford have made some valuable discoveries on Summit creek. The ore is a sand carbonate very similar to the Leadville ore, and is found in the same formation as is the mineral at Leadville. It runs well.

IDAHO.

A FINE BONANZA.—Idaho *World*, May 16: Last Saturday morning we took a ride to the Forest King mine. We went into the lower tunnel, followed this tunnel to where it tapped the ledge, then climbed up a raise 100 feet, and then struck out through a drift, at the face of which the vein matter is three feet wide, all good pay ore. From there Ed. Mcriarty escorted us up through a man-way, 15 or 20 feet, and into a stope, where Johnson, who was formerly shift boss in the Banner mine, was at work on a five or six foot body of fine ore. Here the ledge lies almost flat. The vein, in both the drift and stope, is well defined, and the walls of granite are very smooth, look like they had been polished. The ore is soft and easily mined. the vein is large and extensive, and best of all is rich in the precious yellow metal. After a few minutes, we crawled down the man-way, followed the drift some distance east, to an old shaft, sunk years ago, and climbed up through it—about 50 feet—to the upper tunnel, and through this out to the surface. The lower tunnel which tapped the ledge at the depth of 300 feet, is 600 feet long and was driven through the hardest kind of granite. The tunnel was not timbered. Drifts were run quite a distance each way on the vein from this tunnel. The ledge is very wide and carries good ore at that depth. The foot-wall has not been struck. To ascertain the width a cross-cut will have to be run. This 600-foot tunnel was completed about 18 months ago. The raise was then put up to connect with the old shaft, for fresh air, and when the connection was made the drift in which they are now working was started. After stoping out the ore above this 200-foot level, they will go to work in the lower or 300 foot level. They have a large body of ore opened up, and of a class that entitles the Forest King to a place in the front rank of Idaho bonanzas.

DEER CREEK MINING NOTES.—The Montana mine is now producing about two and a half tons of first-class ore per day, which is being shipped the sampler by Clay & Co's teams. P. McMonigie has resumed work on the Sunday Night, and is sacking ore for shipment. The Davitt has not resumed operations this season, but it is reported that the superintendent will arrive from the East shortly. From the Illinois and Nagog, on Panther gulch, Young & Co. are making regular shipments. The Narrow Gauges, since the connection in No. 1, are stoping out large quantities of first-class ore. Up Wolftone gulch Messrs. Erving and Hiller have commenced grading a road to the Cyclops, from which they have a contract to haul a large amount of ore to the sampler. Fred. Kinsley recommenced work on the New Comet yesterday, and will soon have as big a bonanza as any mine-owner on Wood river. All the gulches below the gold mines, near the Comet, have been located for placers, and two companies are already opening up the gronnd. The reporter was recently shown about half an ounce of coarse gold panned out during three days' prospecting by two men.

CŒUR D'ALENE MINES.—Murray *Sun*, May 12: The Myrtle claim in Trail gulch has again broken the monotony in the gold output by sending over to the bank of Murray a 10 ounce nugget. It contains a large amount of quartz, but is very heavy for its size. It is nearly round and no bigger than a hen's egg. J. W. Empfield, of Mullan, reports that the prospects are brightening from day to day, and that new discoveries are constantly being made, but neither their extent nor richness can be determined for some time yet. But the quality of the ore brought to Mullan justifies the most brilliant hopes for the future of the camp. Jack Enright yesterday showed the reporter some very rich gold quartz of a bluish nature which was brought down from a discovery on Reeder gulch in which he is interested. The quartz is thoroughly impregnated with fine gold. One large piece on being broken into three smaller ones, revealed flower gold all through the rock. The find is considered one of the best yet made in the camp.

A ROCK CREEK CLAIM.—As reports of a big strike of ore in the Montezuma mine, at Rock creek, have been in circulation for some days, a *Times* reporter this morning asked Messrs. Pinney and Stevenson, the leasers, if there was anything in the reports? Mr. Pinney said: "Not much. We have shipped 16 tons that assayed 101 ounces, have another 10 or 12 ton lot about ready to bring in, and have about enough in sight to keep going about one month. The ore may last one month and may not. Those are the facts." Mr. Stevenson supplemented the above with the statement that they were working 10 men—all they were allowed to by the lease—and that the claim looked well. The Montezuma is near the Guy, at head of one of the branches of Rock creek.

THE CYCLOPS.—Wood River *Times*, May 14: Eugene O'Callaghan went up to the Bullion divide, yesterday to see the Cyclops, the claim in which Dave Lawrence and Dan Reilly recently opened an ore vein. The openings show from four to 15 inches of solid high-grade galena ore, the length of the chimney on the tunnel level is over 75 feet, there are about 15 tons of ore on the dump, and the owners are getting ready to put in a car-track and begin stoping. They have contracted the hauling of ore to Hailey for $3 per ton, and expect to employ 15 or 20 men all summer.

LAVA DISTRICT.—Wood River *Times*, May 16: The town of Erie, in Lava district, is a rather lively camp, if reports from there are wholly reliable. The camp is prosperous, nearly every prospect showing well from the very surface, and locations are so numerous they almost join for stretches covering section after section of land.

MONTANA.

INDEPENDENCE DISTRICT.—*Inter-Mountain*, May 14: The Little Darling is developed by a vertical shaft, 100 feet deep, from which three levels have been extended east and west on the ledge. The face of the 25-foot level is 100 feet east of the shaft and 30 feet west. The pay streak has a width of three feet, assaying 40 ozs. silver. It is enclosed within well-defined and regular walls. The ore is a sulphuret requiring to be chloridized. The present product of the mine is 25 tons daily, and the force employed is 25 men under the foremanship of Charley McAuliff. The property is provided with a 20-horse-power hoist and a No. 4 Knowles pump, which readily handles the water. The ore has been worked for some time past in the Lexington mill, supplying ten stamps, but the output has so increased of late that ten more stamps will be devoted to that purpose. The Little Darling is owned by P. A. Largey et al., and is now under lease and bond to Bishop et al., who have it bonded for $75,000. Sam Harvey & Co. have a lease on a portion of the Nettie, and are stoping on the south vein at a depth of 50 feet, where they have a two-foot ore body assaying $40. On the Narrow Gauge, Olsen Brothers, the lessees, have sunk a shaft 40 feet deep, from the bottom of which a drift on an ore body three feet wide has been run 40 feet east. The product carries from 60 to 70 per cent manganese and 15 in silver. It is used chiefly as a flux by the Colorado smelter. The shipments are five tons per day. The Brilliant is under lease to Fred. Alverson & Co., who have just begun work. The shaft is 60 feet deep and will be dropped to the 115-foot station before drifting will begin. The ore previously extracted from the mine assayed well in silver and ran high in manganese, making it very desirable as a flux. On the Self-Riser Henry Williams is working a small force in the 50-foot level, from which about seven tons of ore, assaying 15 ounces in silver, and 50 per cent manganese are being daily hoisted to the surface. The Self-Riser is a well-known property and was once a heavy producer of good ore. It needs only development. The Blue Bird, the acknowledged bonanza of the district and one of the most valuable properties in the county, will be fully described in a future article. A dump pile containing 7,000 tons of good milling ore gives some indication of the productive capacity of the mine. The old Burlington mill has been leased or bought by Menary & Billings, and has the promise of an abundance of custom ore. The Bay Horse is owned by Paul Davis, and is under lease to Jim Sterrit who is working seven men. The incline is 50 feet deep, and drifts have been run on a body of clean sulphuret ore two and a half feet wide and carrying 40 ounces in silver. Fifty tons of good milling ore are now on the dump, which is rapidly increasing in size.

VARIOUS DISTRICTS.—Helena *Independent*, May 16: A shaft is being sunk on the Amago lode, situated on Mount Helena, and at a depth of 15 feet shows up some excellent carbonate ore. A new discovery within two miles of Helena was made yesterday, the ore of which shows a large amount of free gold. F. E. Tibbitts has taken up a gold-bearing lode within a mile of the city. The Fargo lode in the same vicinity shows a large vein carrying free gold. Several new quartz locations were yesterday made at the mouth of the Little Prickley Pear. Milo Courtright and E. R. Taudy yesterday bonded of Isabel & Co. the North Star Lode, located on Nevada creek. The bond is for $20,000 and runs for three months. There are Eastern parties negotiating for its purchase. Ed. Delaney arrived in this city yesterday, bringing with him $5,000, taken from his placer claim in St. Louis gulch. It was the result of a three weeks' run. John Keating has made a new discovery on Beaver creek. He has sunk an 18-foot shaft and found a four-foot vein, the assays from the same averaging $400. A number of discoveries have been made in that vicinity and great excitement prevails. S. C. Hudson has made two very rich strikes in the New Helena district, one being a vein of five feet, which assays $83 in silver and $30 in gold; the other, a four-foot vein, assays 56 ounces in silver and 5½ ounces in gold. Mr. J. Clark has also struck a lead in the same vicinity that goes $90 in silver and $30 in gold. The Island Pond lode, situated this side of Montana City, on Jackson creek, is showing up well and assays of some of the quartz made yesterday showed it to be a fine prospect. A rich lead is being worked directly back of the Union Brewery. Reports from Ten Mile district say that the Syndicate company are employing about 75 men and are pushing work ahead at a rapid rate. We are reliably informed that all the mines bonded by the company will be taken up.

OREGON.

WATER LOW.—Jacksonville *Times*, May 16: Water is getting low at the mines of Wimer & Sons and Deselles & Connell. The Enterprise Mining Co. of this place propose going down still deeper on their ledge. M. F. Knapp, an old prospector, has located the quartz ledge formerly worked by Sam Bowden and others on Jackson creek and will thoroughly prospect that region. Keaton & Klippel, of Poorman's creek, have suspended operations, but will probably open a drift this season. They were unable to clean up, owing to the scarcity of water.

UTAH.

WATER.—Park *Record*, May 16: The Crescent mines are troubled a great deal with surface water this spring. The nature of the soil is such that it absorbs all the moisture on its surface, and there have been a great many days of warm melting weather and the water has come into the workings of this company to such an extent as to cause a suspension of operations for a week or two, and the discharging of about thirty men. Of course this will not affect the shipments of first-class ore as there are said to be about 500 or 600 tons in the ore-house, which will be shipped as soon as the canyon roads are open. Neither will this exceeding moisture conflict with the shipments of concentrates as there is a great quantity now at the mine ready for shipment and coming down daily.

REVIEW.—Salt Lake *Tribune*, May 18: The receipts in this city for the week ending May 13th, inclusive, were $66,054.03 of bullion and $21,460 of ore, an aggregate of $87,514.03. The week previous the receipts were $95,632 58 in aggregate, of which $82,572.58 was bullion. The Ontario sent in during the week thirty-four bars of bullion, of the value of $21,714.03, bringing its output for the present year to $622,721.54, from which $300,000 in monthly dividends of $75,000 each has been paid. The mill will start again after the clean-up with renewed vigor. From Tintic we have had during the week sixteen bars of Riter bullion, valued at $13,000—a new and pleasing item in the shipment reports. The silver sandstones have yielded $5,950 during the week, of which the Christy sent up two silver bars, $3,100, and the Stormont two silver bars, $2,850. The product of the Hanauer smelter has been for the week nine cars of bullion, $21,500.

MINES OVER THE RANGE.—A gentleman in from Ophir reports that camp, Dry Canyon and Stockton are all looking up. Considerable work has been done during the past winter, and as soon as the snow-drifts in Ophir are melted, several shipments of very good ore will be made. A number of leases have been made of old properties on Lion Hill, and flattering results are expected. More work, it is said, will be done in that camp this season than during any time for a number of years past. The same is true of Dry Canyon and Stockton, the mines in both of which camps will make a handsome yield for 1885.

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We invite the acquaintance of all parties connected with inventions and patent right business, believing that the mutual confereuce of legitimate business and professional men is mutual gain. Parties in doubt in regard to their rights as assignees of patents or purchasers of patented articles, can often receive advice of importance to them from a short call at our office.

Remittances of money, made by individual inventors to the Government, sometimes miscarry, and it has repeatedly happened that applicants have not only lost their money, but their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees intrusted to our agency.

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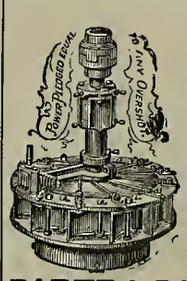

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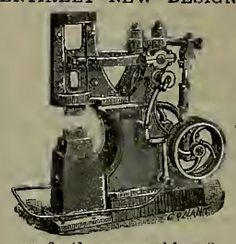

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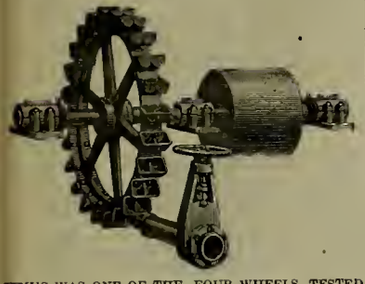

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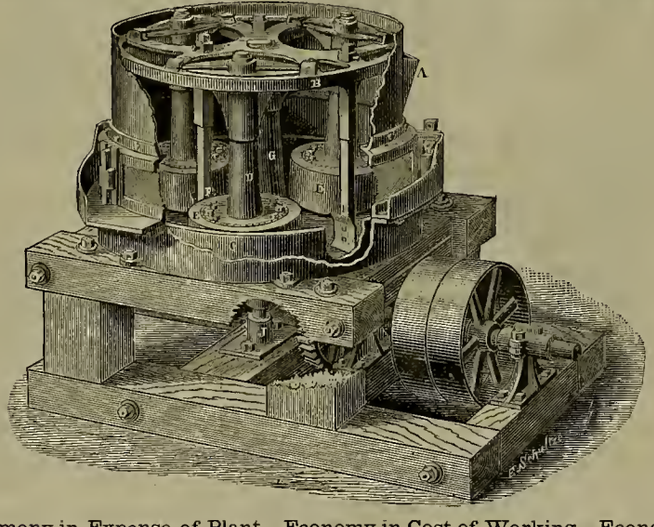

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New Mexico Notes.

[From our Traveling Representative.]

A steam drill is now used in the Old Man miue at Fleming.

Tbe new mill of the Peacock mine at Cooney is nearing completion.

The Mimbres mill at Georgetown is producing about $1,000 per day in bullion.

A carload of ore from the Malone group of mines was shipped from Lordsburg last week.

Experimenting is still the order of things at Col. Carpenter's reduction works at Silver City.

The well-known civil engineer of Tombstone, J. G. Parke, is now interested in mines at Gold Hill.

Lordsburg is so situated as to be the shipping point of a number of substantial mining districts.

Tbe Ownhy house, at Lordsburg, should have been called the Mining Exchange. It is the headquarters of miners and mining men.

Prospects in Grant county and along the line of the A. & N. M. railroad, between Lordsburg and Clifton, have brightened up quite briskly of late in mining interests. The road now runs two trains per day and an occasional extra.

A reliable and trustwortby paper in a mining district is like a good mine. It is invaluable to community, and the home protector of the patrons of the district who reside elsewhere. The Silver City *Enterprise* is one of these kind of newspapers.

San Francisco capitalists have an eye on Grant county, New Mexico. The recent activity shown in her excellent mines have attracted the attention of men who are authority on mining, and a number of them are seeking investment in Grant county. Pacific Coast capitalists are quite numerous at present in this vicinity.

The Nugget, in East Carlisle district, has one of Baker's mining horse-power hoists on it. The machine has proved itself to be "a dandy," to use the expression of miners wbo witnessed its workings. Such machinery is peculiarly adapted to prospecting a mine, and does away with the expensive stamp power usually resorted to by many men whose imagination in the start is bigger than their mine.

A well-to-do Eastern man said to me a few days ago in mentioning an Eastern company's property that was paying good dividends: "You Californians and Western men will not believe a property can be made to pay by Eastern men; now what do you think of our property?" "Who is the superintendent of your mine?" I asked. "Mr. So and So," answered the Easterner. "Where is he from?" I inquired. "He's from Nevada—excuse me, I want to see that man across the street," hurriedly added the capitalist as it dawued upon him that his management was anything but Eastern.

Unusual activity prevails in the Gold Hill district, 12 miles north of Lordsburg. Two mineral belts, one gold aud the other silver hearing, rnn parallel to each other, but a short distance apart. The formations are porphyry and granite, with some shale and lime. The silver ores carry a little lead, the silver occurring in different forms. Tbe gold ores are a free-milling quartz, showing more or less free gold. No depth to speak of has been reached, but so far as prospected the showing has been excellent, especially so as to the gold belt. The results of mill-runs and assays show the ores of the camp to be of a low grade, but of such a character as to be easy to treat and not difficult to extract in large quantities. A scarcity of water is tbe camp's greatest drawback just at present. The large number of practical miners now prospecting about Gold Hill bids fair to open up a number of good properties duriug the present season.

In few districts are the various ores as hard to treat profitably as tbose of the Carlisle. The use of the most improved machines are necessary. No company has spent so much money to bring about a successful treatment of their product as the Carlisle people. It will be of interest to mining and milling men to know the results of their expense and practical experiments with many machines. The Duncan concentrators proved to he the most successful as well as the least expensive in haudling the ores. The enviable reputation these machines have in this vicinity speaks well of mining meu's appreciation of fine machinery. A detailed description of the workings of the "Duncan" would no doubt be of interest to our readers, but as such would take too much space to do justice to the machine, and I don't happen to be selling concentrators at present, I will refer those who are interested to the Pacific Iron Works of San Francisco, who no doubt will be glad to forward any information on the subject asked for. There is talk of a number of other mills similar to tbe Carlisle going up soon in Grant county. F. W. S.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCA'N.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alta S M Co	Nevada	32	25	Apr 30	June 4	June 24	W H Watson	302 Montgomery st
Baker Divide M Co	California	9	25	May 12	June 15	July 6	D M Kent	330 Pine st
Buchanan G M Co	California	12	15	Apr 14	May 18	June 5	P J Sellwan	121 Post st
Belmo t M o	Nevada	39	15	F b 11	May 7	June 1	J W Pew	310 Pine st
Chollar M Co	Nevada	16	50	May 11	June 24	July 15	C E Elliott	309 Montgomery st
C n Imperial M Co	Nevada	22	10	May 20	June 20	July 15	O L McCoy	329 Pine st
Champion M Co	California	19	08	Apr 23	June 1	June 19	T Wetzel	522 Montgomery st
Daisy Cement M Co	California	3	2	Mar 28	May 5	May 27	G J Collins	512 Montgomery st
Endowment M Co	Nevada	5	50	May 19	June 22	July 20	E M Hale	327 Pine st
Golden Fleece G M Co	Ca fornia	1	20.00	Apr 18	May 25	June 15	F Schirmeier	Phelan Block
Hale & Norcross S M Co	Nevada	85	50	May 6	June 9	June 29	E B Holmes	309 Montgomery st
Iowa M Co	Nevada	17	05	Apr 29	June 6	June 27	C C Leavitt	510 Battery st
Ja ia Con M Co	Arizona	23	10	Apr 6	M y 13	June 5	J Stedtfeldt	412 California st
Loreto M and M Co	Mexico	08	15	Apr 28	May 29	June 22	H G Jones	327 Pine st
M ytlower Gravel M Co	California	29	10	Mar 26	May 5	May 28	J Monizo	328 Montgomery st
Mexican M Co	Nevada	55	20	Apr 20	May 23	June 13	G D Edwards	414 California st
Noche Buena M Co	Mexico	1	11	Mar 27	May 8	May 29	C Hart	106 Battery st
Overman S M Co	Nevada	55	20	Apr 20	May 23	June 12	G D Edwards	414 California st
Potosi M Co	Nevada	18	30	May 13	June 19	July 10	C E Elliott	309 Montgomery st
Pinal Con M Co	Arizona	6	06	Apr 10	May 18	June 8	W Letts Oliver	328 Montgomery st
Puget Sound Iron Co	Wash Ter	11	50	Apr 14	May 25	June 25	A Halsey	328 Montgomery st
Peerless M Co	Arizona	4	50	May 18	June 23	July 17	A Waterman	309 Montgomery st
Santa Anita M Co	California	8	02	Apr 23	May 26	June 16	J M Buffington	309 California st
Sulphur Bank Q M Co	California	3	50	Feb 25	Apr 16	Jun 1	L Hermann	220 Sansome st
Union Con M Co	Nevada	30	25	Apr 16	May 20	June 9	J M Buffington	309 California st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Crown Point M Co	Nevada	J Newlands	329 Pine st	Annual	June 1
Chalidonia Mg Co	Arizona	I Adams	318 Montgomery st	Annual	June 1
Gagnere M Co	California	G R Wilson	402 Montgomery st	Annual	June 2

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Kossuth M Co	Nevada	C K Sturtevant	328 Montgomery st	06	Mar 1
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	20	May 2
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Feb 1
Plymouth Con G M Co		W Van Norden, Pres.	23 Nassau st, N Y	50	Apr 1
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Feb 1
Syndicate M Co	Nevada	J Stadfeld Jr	419 California st	10	May 5

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE. May 14-20	Portland. Rain	Temp.	Wind	Weather	Red Bluff. Rain	Temp.	Wind	Weather	Sacramento. Rain	Temp	Wind	Weather	S. Francisco. Rain	Temp.	Wind	Weather	Los Angeles. Rain	Temp.	Wind	Weather	San Diego. Rain	Temp.	Wind	Weather
Thursday	1.08	60	S W	Cy.	.00	68	E	Fr.	.—	67	S	Fr.	.04	59	W	Fr.	.00	71	W	Cl.	.00	67	W	Cl.
Friday	.11	60	S	Cy.	.00	72	S	Cl.	.00	70	S	Cl.	.00	59	NW	Cl.	.00	75	S W	Cl.	.00	70	S	Cl.
Saturday	.39	62	N	Fr.	.58	76	N	Cl.	.00	66	NW	Cl.	.00	63	W	Cl.	.00	70	S	Fr.	.00	69	S W	Cl.
Sunday	.00	65	N	Fr.	.00	79	NW	Cl.	.00	73	S W	Cl.	.00	60	S W	Cl.	00	75	S W	Cl.	.00	—	—	—
Monday	.00	64	SE	Fr.	.00	82	N	Cl.	.00	74	NW	Cl.	.00	60	W	Cl.	.00	71	S W	Cy.	.00	69	S W	Cl
Tuesday	.52	57	S W	LR.	.00	68	S	Cy	.00	74	S	Fr.	.00	61	NW	Fr.	.00	73	S W	Cl.	.00	66	W	Cy.
Wednesday	27	54	S W	Cy.	00	72	N	Cl.	00	67	NW	Cl.	.00	61	W	Cl.	.00	78	S W	Cl.	.00	72	S W	Cl.
Totals	2.37				58				.—				.04				.00				00			

EXPLANATION.—Cl. for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature wind and weather at 12:00 M. (Pacific Standard time), with amount of rainfall in the preceding 24 hours.

Bullion Shipments.

Golden Crown (Bernice), May 16, $16,500; Queen of the Hills, 12, $3,000; Hanauer, 12, $2,400; Christy, 13, $1,650; Honerine, 13, $4,700; Hanauer, 13, $7,000; Stormont, 13, $2,850; Riter, 13, $2,500; Christy, 14, $1,450; Hanauer, 15, $2,500; Queen of the Hills, 14, $1,600; Creseent, $14, $6,000; Hanauer 15, $2,500; Germania, 13, $14,197; 16, $4,467. During the past week there were shipped out of Salt Lake twenty-seven bars of bullion 650,593 pounds, and 50 cars of ore weighing 1,288,914.

Our Agents.

OUR FRIENDS can do much in ald of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
J. J. BARTELL—Sacramento and San Joaquin Counties.
A. C. KNOX—San Louis Obispo and Santa Barbara Co.
G. W. INGALLS—Arizona.
M. S. PRIME—Alameda County.
MRS. OZIER—California.
E. L. RICHARDS, San Diego, County.
F. W. SMITH, New Mexico and Arizona.
W. B. TURNER, California.
L. J. SAFLEY—Alameda Co.
GEO. MCDOWELL—Fresno Co.

Mining Share Market.

Notwithstanding the lack of bonanzas on the Comstock just at present, that mining seetion still controls the share market in this city, and the progress of development in the principal mines there gives the key to prices here. The recent flood of hot water in the lower levels of the Hale and Norcross, now drained, did not seem to effect the market here mueh, strange to say, whieh is rather an evidenee that there are strong hopes among dealers in mining shares that something good will be developed in that mine. As the *Enterprise* well says, the Hale and Norcross would seem to be the tap-root, so to speak, of the Comstock mining situation. Deep mining has been prosecuted heretofore all along the lode, but this is the deepest bonanza prospect yet found. All surrounding and inclosing regions, geological and mineralogical, show a strong concentration from all sides toward that one point in the matter of depth. The deepest root of the Comstock tree seems to strike down right there, and there may be found the rich, nutritious bed of wealth from which has proceeded the ripened bonanzas found and worked in the uppe branches of the grand old tree in times past. These productive branches have reached to the surface to the north in Virginia City and south in Gold Hill, and their fruit has been bullion millions. Future developments alone may tell what shall be found materialized away down among the bullion roots of the fruitful old Comstock tree.

The daily output of ore from the north and south braneh es continues and somewhat increases, and in the sweet by and by perhaps the low-grade ore resources of the middle section may be brought into active requisition. The Comstock lode constitutes the foremost mine of the world to-day, notwithstanding its redueed production. Hundreds of millions have been taken from it, and there are yet hundreds of millions in it.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Apr. 30.		WEEK ENDING May 7.		WEEK ENDING May 14.		WEEK ENDING May 21.	
Alpha	.90	1.05	.95	1.00	1.00	1.30	1.10	1.40
Alta	.20	.30	.15	.25	.20	.40	.20	.40
Andes	.30	.40	.30	.55	....	.60	.45	.60
Argenta	....	....	....	....	....	.10	....	.05
Belcher	....	1.00	1.00	1.05	....	1.20	1.10	1.30
Belding	....	....	....	....	....	....	....	....
Best & Belcher	1.65	2.00	1.75	2.75	2.40	2.95	2.80	4.65
Bullion	.30	.40	.35	.45	.40	.50	.35	.40
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	....	.26	.35	.20	.30	....	....
Bodie Con	1.50	1.60	1.50	1.60	1.30	1.50	1.50	1.60
Benton	.05	.10	....	....	....	.10	.10	.15
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.25	.30	....	.30	....	.30	.30	.50
California	.70	.90	.85	1.45	1.50	1.75	1.55	2.00
Challenge	....	....	....	....	.25	.30	....	.30
Champion	....	....	....	....	....	....	....	....
Chollar	1.25	1.55	1.30	1.50	1.20	2.50	1.60	2.35
Confidence	....	1.40	1.25	1.35	1.30	1.50	1.65	1.75
Con. Imperial	....	....	....	....	....	.15	....	.20
Con. Virginia	.70	.90	.85	1.45	1.30	1.75	1.55	2.00
Con. Pacific	....	....	....	....	....	....	....	....
Crown Point	1.20	1.65	1.35	1.45	1.35	1.55	1.35	1.65
Day	....	....	....	....	....	....	....	....
Eureka Con	5.50	7.88	7.20	8.75	5.75	8.87	6.25	7.50
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	....	.20	.30	.35	.35	.40	.35	.40
Grand Prize	....	....	....	....	....	.75	....	.75
Gould & Curry	1.15	1.55	1.15	1.60	1.45	1.80	1.85	2.50
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	4.50	6.50	5.25	6.00	6.12	7.50	6.87	8.32
Holmes	3 65	3.75	....	....	....	4.00	....	4.30
Independence	....	....	....	....	....	....	....	....
Julia	.05	.10	....	.05	....	....	....	.10
Justice	....	.15	....	.15	....	.15	....	.15
Martin White	....	.45	....	....	....	.40	....	....
Mono	1.10	1.50	1.15	1.45	1.15	1.40	1.20	1.25
Mexican	.60	.65	.60	.80	.90	1.25	.90	1.30
Mt. Diablo	....	3.80	....	3.80	....	....	....	3.85
Northern Belle	....	....	....	....	....	....	....	....
Navajo	.90	1.05	1.10	1.70	1.05	1.35	1.20	1.30
North Belle Isle	....	.10	.10	.20	....	.15	....	.15
Occidental	1 30	1.55	1.40	1.50	1.50	2.00	....	1.40
Ophir	.50	.65	55	1.25	1.10	1.7	1.20	1 60
Overman	.10	.15	10	.15	.15	.20	.20	.25
Potosi	.50	.65	.50	.65	.55	.95	.70	.95
Pinal Con	....	....	....	....	....	....	....	....
Savage	2 60	3.40	2.65	2.95	2.90	3.65	3.60	4.10
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	.80	.90	.85	1.30	1.15	1.40	1.15	1.60
Silver Hill	....	....	....	.10	....	....	....	....
Silver King	....	....	....	....	....	....	....	3.00
Scorpion	.10	.13	.10	.15	.15	.20	.15	.25
Syndicate	....	.25	....	.45	....	.35	....	.40
Sioga	....	....	....	....	....	....	....	....
Union Con	.45	.55	.45	.80	.70	1.00	1.10	1.40
Utah	....	....	1.00	1.30	1.75	2.25	1.75	2.00
Yellow Jacket	2.10	2.65	2.25	2.60	2.50	3.00	2.75	3.10
	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY A. M., May 21.

100 Alpha.....1.25
100 Alta.....30c
700 Andes.....60@65c
825 B. & Belcher...4.55@5.00
500 Bullion.....40@45c
50 Belle Isle.....25c
985 Chollar.....2.20@2.25
1365 Con Va & Cal..2.20@2.25
100 Crown Point.....1.40
100 Con. Imperial.....10c
850 Exchequer.....40@45c
645 Gould & Curry.2.60@2.70
350 Hale & Nor.....7.25
50 Holmes.....1.50
800 Justice.....15c
250 Mexican.....1.40
325 Navajo.....1.25
970 Opbir.....1.70@1.75
100 Overman.....35c
10 Occidental.....1.70
750 Potosi.....90c
320 Savage.....3.35@3.90
300 Sierra Nevada.....1.60
200 Scorpion.....25c
650 Union.....1.50
110 Yellow Jacket..2.75@2.80

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, May 21, 1885.

ANTIMONY—Per pound		@	—
Hallett's	12	@	—
Cookson's	13	@	—
BORAX—Refined	7	@	8½
IRON—Glengarnock ton	25 00	@	—
Eglinton, ton	23 50	@	—
American Soft, ton	27 00	@	—
Oregon Pig, ton	—	@	—
Clipper Cap, Nos. 1 & 4	25 00	@	30 00
Clay Lane White	26 00	@	—
Shotts, No. 1	26 00	@	—
STEEL—English, ₩	15	@	25
Black Diamond, ordinary sizes	13	@	—
Plow	6	@	8
Machinery	10	@	12
Sanderson Bros	13	@	—
COPPER—			
Braziers' sizes	—	@	25
Fire-box sheets	28	@	—
Bolt	22	@	—
Yellow Metal	14	@	15
Ingot	14	@	15
LEAD—Pig	3½	@	3¾
Bar	5	@	—
Pipe	7	@	—
Sheet	8	@	—
Shot, discount 10% on 500 bag	Drop, ₩ bag.	1 86	@ —
Buck, ₩ bag	2 05	@	—
Chilled, do	2 25	@	—
TINPLATE—Oldcastle	5 25	@	6 00
Charcoal	5 75	@	6 75
Coke	5 25	@	5 50
Roofing	6 25	@	13 50
ZINC, German	9	@	10
Sheet, 7x3 ft, 7 to 10 ₩, less the cask	9	@	10
QUICKSILVER—By the flask	33 50		
Flasks, new	1 05	@	—
Flasks, old	85	@	—
NEW YORK PRICES—			
California Borax, refined	8	@	8¼
Pig Iron, American	17 00	@	18 00
Quicksilver	42½	@	—
Lead	3 70	@	—
Copper	11¾	@	—
Tin	18¾	@	—
Bar Silver	1 08¾	@	—

REMITTANCES to this office should be made by postal order or registered letter, when practicable. Cost of postal order for $15 or less, 10 cents; for registered letter, in addition to regular postage (at 2 cents per half ounce), 10 cents.

NOTICE TO MINING MEN!

Silver Plated Amalgamating Plates for Saving Gold.

STOP PAYING FOR SILVER YOU DO NOT GET!

We Guarantee FULL WEIGHT in Silver.

GOLD MEDAL AWARDED.

☞ ALL OUR PLATES ARE ASSAYED. Get our prices before ordering elsewhere. Samples furnished on application.

CHICAGO PLATING COMPANY, 21 Stevenson Street,

JUSTINIAN CAIRE, Dealer in Mining Material, Agent, 521 and 523 Market St, San Francisco, Cal.

PACIFIC IRON WORKS

1850. 1885.

RANKIN, BRAYTON & CO.,

...BUILDERS OF....

MINING MACHINERY.

San Francisco:	Chicago:	New York:
127 First Street.	109 N. Clinton.	145 Broadway.

PLANTS FOR GOLD AND SILVER MILLS, embracing machinery of LATEST DESIGN and MOST IMPROVED construction. We offer our customers the BEST RESULTS OF 35 YEARS' EXPERIENCE in this SPECIAL LINE of work, and are PREPARED to furnish from SAN FRANCISCO or CHICAGO, the MOST APPROVED character of MINING AND REDUCTION MACHINERY, adapted to all grades of ores and SUPERIOR to that of any other make, at the LOWEST POSSIBLE PRICES.

We are also prepared to CONSTRUCT and DELIVER in COMPLETE RUNNING ORDER, in any locality, MILLS, CONCENTRATION WORKS, WATER JACKET SMELTING FURNACES, HOISTING WORKS, PUMPING MACHINERY, ETC., ETC., of any DESIRED CAPACITY.

WATER JACKET SMELTING FURNACES

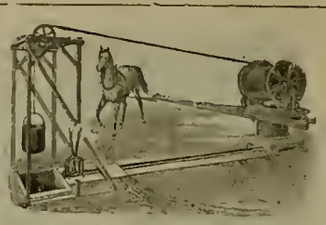
For COPPER and ARGENTIFEROUS LEAD ores of NEW and ORIGINAL DESIGNS, covered by LETTERS PATENT. No other Furnace CAN COMPARE with these for DURABILITY, and in CAPACITY for uninterrupted work. MORE THAN 150 of them are now RUNNING in various parts of THIS COUNTRY, as well as many in FOREIGN COUNTRIES, giving results NEVER BEFORE ATTAINED as regards CONTINUOUS running, ECONOMY of fuel, AMOUNT and QUALITY of BULLION produced. These CLAIMS have been PROVEN BY RESULTS in ANY NUMBER of INSTANCES, and the GREAT SUPERIORITY of this SYSTEM of smelting ores DEMONSTRATED BEYOND QUESTION. COMPLETE PLANTS furnished to order of any CAPACITY, with ALL IMPROVEMENTS that experience has DEMONSTRATED as VALUABLE in this class of work.

WATER JACKET SMELTING FURNACES

THE DUNCAN CONCENTRATOR

Beyond question the cheapest and most effective machine of the kind now in use adapted to all grades and classes of ores.

This machine has been THOROUGHLY TESTED for the past TWO YEARS, under a GREAT VARIETY of CONDITIONS, giving most EXTRAORDINARY results FAR IN ADVANCE of anything EVER BEFORE REALIZED. A recent COMPETITIVE TEST at the Carlisle Mine in Mexico, showed an ADVANTAGE OF OVER 30 PER CENT in favor of THE DUNCAN. The amount SAVED OVER THE FRUE being sufficient to PAY THE ENTIRE COST of the machines EVERY MONTH OF THE YEAR. One of its MOST VALUABLE features is as an AMALGAMATOR. It saves all THE AMALGAM GOLD and SILVER that ESCAPES the BATTERIES, PANS or SETTLERS, making the machine worth MORE than ITS COST for THIS PURPOSE ALONE.



Baker's Mining Horse Power.

Possessing all the requirements of a first-class hoist, and affording means for the continuous operation of a Pump or Blower, without interfering with a hoisting apparatus. It is made entirely of iron, no piece weighs over 300 pounds. At the ordinary speed of a horse, a 1,000-pound bucket of ore may be raised 120 feet per minute. The hoisting-drum is under the complete control of the man of the shaft, and is capable of carrying 500 feet of five-eighths steel rope. SEND FOR CIRCULAR.

HOISTING WORKS.

List of U. S. Patents for Paoific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING MAY 12, 1885.

317,701.—REVERSIBLE HINGE—J. F. Aston, Watsonville, Cal.

317,706.—CAR AXLE—Geo. W. Bedbury, Portland, Or.

317,619.—CABLE GRIP—W. A. Burke, S. F.

317,621.—ORE CONCENTRATOR—N. Butler, Enniss, M. T.

317,637.—DEVICE FOR REMOVING NUTS—P. G. Gesford, Jr., Napa, Cal.

317,793.—LAYING ARTIFICIAL STONE, ETC.—P. H. Jackson, S. F.

317,551.—TULE BUNCH MACHINE—C. Leduc, Stockton, Cal.

317,556.—HORSE HAY-FORK—C. Maginnis, S. F.

317,573.—ELEVATOR LIFTER FOR THRESHERS—W. J. Pulliam, Chico, Cal.

317,577.—WAGON-JACK—J. T. Reid, Reno, Nev.

317,872.—SHIRT—W. M. Spence, Carson, Nev.

317,590.—R. R. STATION SIGNAL—A. A. Sprague, San Rafael, Cal.

317,687.—PATTERN-MAKING MACHINE—C. Tourigne, S. F.

317,894.—CAR-COUPLING—A. W. Van Dorston, Portland, Or.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

HORSE HAY-FORK.—Christopher Maginnis, S. F., No. 317,556. Dated May 12, 1885. This improvement in horse hay-forks consists of a tubular head for the fork, a means for receiving the fork tines to the head, and the frame by which the fork is suspended latched to retain its load, or unlatched to discharge it. The fork is made light and strong, and the head is supported from points near each tine, so that it is impossible for it to bend or sag out of shape by reason of the weight of the load.

DEVICE FOR ADJUSTING AND REMOVING NUTS.—Preston G. Gesford, Jr., Napa. This device for setting up and removing nuts is intended especially for those upon the ends of axles of vehicles; and the invention consists in a means for readily establishing a temporary connection between the nut and hub of the wheel, whereby upon the movement of the wheel the nut will be rotated to set it up or remove it. The invention further consists in a swinging link or loop pivoted to the nut and adapted to be engaged with the hub in a peculiar manner, so no monkey-wrench is necessary to remove the nut.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its columns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at times), by turning a leaf.

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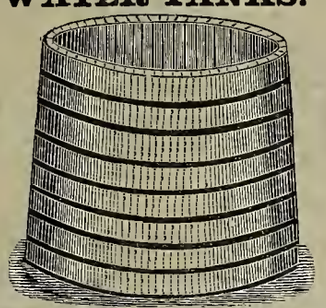

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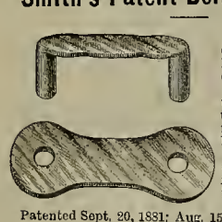

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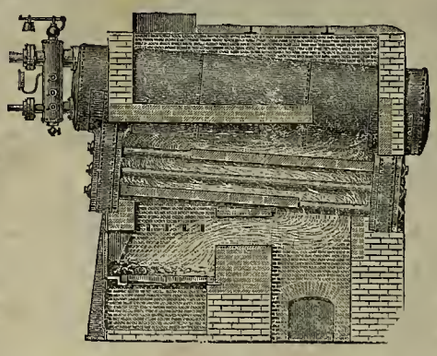

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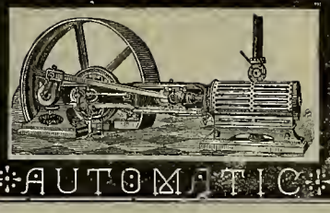

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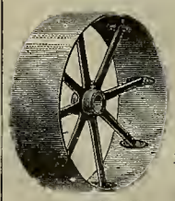

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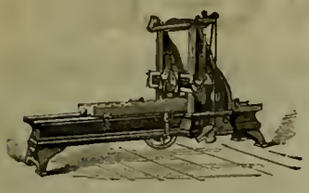

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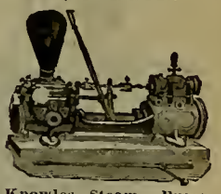

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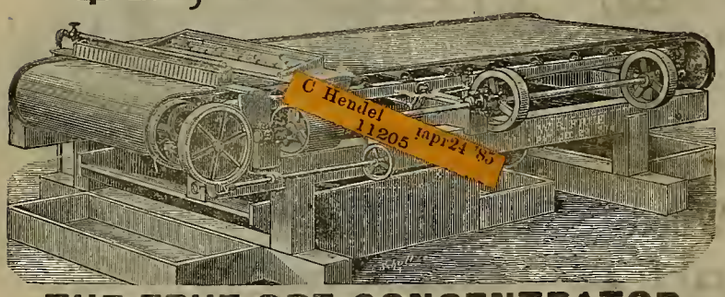

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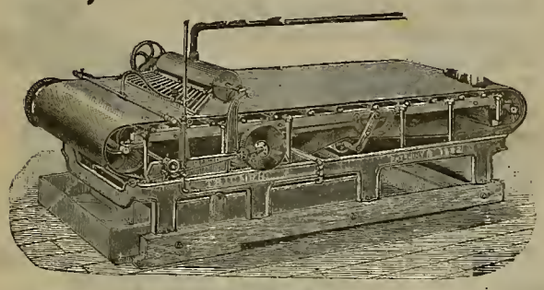

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In a competitive trial recently had between two of the "**Triumph**" **Ore Concentrators** and the same number of "**Frue**" **Vanning Machines**, at the mill of the celebrated gold producing Original Empire Mill and Mining Company, in Grass Valley, Nevada County, Cal., the "Triumphs" produced thirteen and fifteen one-hundredths (13.15) per cent more concentrations than did the "Frue" Vanners, during a run of twenty-four consecutive days, or a net gold coin result of $109.15, or $8.30 per day, in favor of the two "Triumph" Concentrators.

These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company; in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with accurate deductions therefrom, will soon be published in Circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and **we hereby accept the Challenge of $1,000,** flaunted by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

We guarantee purchasers against all costs, expenses or charges incurred by reason of any infringements of any existing patents.

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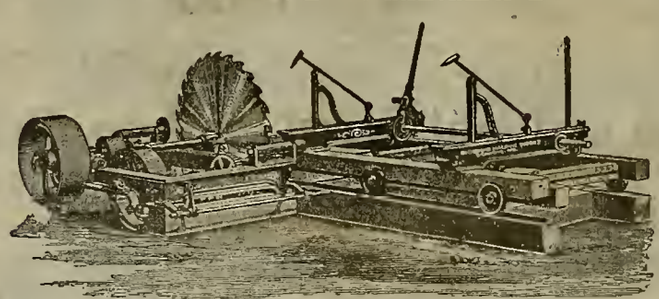

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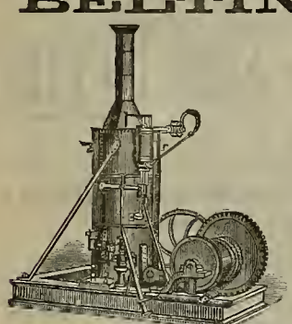

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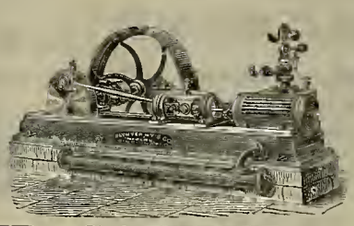

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, MAY 30, 1885.

VOLUME XLXX
Number 22.

The Factory System.

In nearly all industries where raw material can be converted into finished goods by consecutive harmonious processes, carried along by a central power, the factory system has been adopted. In all textile manufactures this has been the case, and the adoption of the new system in the woolen, silk, worsted, flax and all textile trades, followed immediately upon the adoption of the system in the cotton trade. Outside of the textile trade the extension of the system has been rapid indeed, until the statistics of industries of the United States and Great Britain are simply those of manufactures under the factory system.

This statement is in the main true of Belgium, France and Germany; although in France a very large proportion of weaving, especially of fine goods and silks, is still done by hand; in the silk industry in France, however, the power-loom is rapidly displacing the hand-loom. Notwithstanding this general adoption of the system by textile trades in the great manufacturing centers of Europe and America, more than one-half the population of the globe is clothed with hand-made goods.

The system has been more rapid and more varied in its application in this country than anywhere else. As parties engaged in other industries saw the wonderful results of systematized labor in the making of textile they gradually adopted the new order, until now of the nearly three millions of people engaged in the mechanical industries of this country about four-fifths are working under the factory system. Some of the other remarkable instances of the application of the system are to be found in the manufacture of boots and shoes, watches, musical instruments, clothing, agricultural implements, metallic goods generally, fire-arms, carriages and wagons, underwear, rubber goods, etc. Most of these industries have been brought under the factory system during the past thirty years.

It is comparatively few years since the manufacture of boots and shoes was carried on in the little home shops which were attached to or built near the dwellings of the shoemakers. These little shops, in which a few men worked upon the bench upon stock received from the manufacturer cut out and ready to be put together, are closed and the great shoe factory takes its place. In the shoe factory is to be seen the perfect adaptation of the manufacture of goods by successive harmonious processes. The watch factory presents the most completely scientific application of the factory system, and has brought the watch within the means of the poor man. Pianos, house organs, tapestry carpets and many other luxuries are now used by the masses as the result of the factory system of industry.

The instances referred to indicate the vast extent of the application of the system. If they do not, the figures furnished by the census reports, which show that the product of the industries of the United States has reached $6,000,000,000 per annum, will illustrate the extent of its growth. The same authority states that it is quite impossible to arrive at an accurate statement as to the number of persons it would require under the old individual system to produce the goods made by the present factory workers of this country, but by careful computations in some branches of work a rough estimate of the whole would indicate that each factory system employe in 1882 represents on an average at least 50 employes under the individual system. Then it would require about 150,000,000 persons working under the old system to produce the goods made by the three millions or so factory workers of to-day.

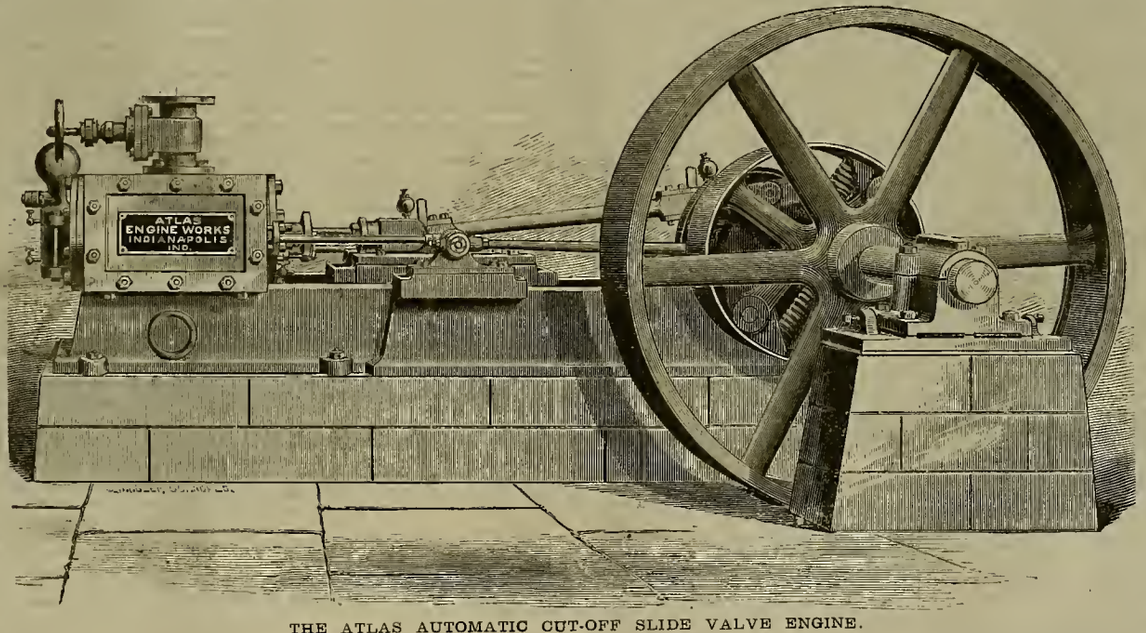
THE MINT STILL OPEN.—An impression has obtained that the Mint in this city was closed. This is not correct, as it is still open and ready to take charge of all the bullion which may be sent for refining or coinage purposes. The superintendent of the Mint has instructed by the Director of the Mint at Washington to cut down his force, and this will be done to the lowest limit compatible with efficient service. It is expected that this order will let out about one fourth of the employes. The Mint is generally closed some time in June for the annual clean-up, and the present year will probably be no exception to this rule. Due notice of the closing of the Mint for this purpose will be officially given at the proper time. The clean-up will delay operations only for a few days and will inconvenience no one.

The Ætna quicksilver mines in Napa county have shut down.

The Atlas Automatic Engine.

The engraving on this page represents one of the improved automatic cut-off slide-valve Atlas engines. The advantages of working steam expansively are well known. The points gained by the automatic cut-off over the plain slide-valve engine with throttling governor are briefly stated as follows: Higher average cylinder pressure, and consequent gain in power for the same boiler pressure; employment of the expansive force, or the use of steam otherwise thrown away in the exhaust, and regularity of motion.

For this engine, a slotted eccentric loose on the shaft, controlled by a shaft governor, operates the valve. The governor weights, moving to or from the center, locate the eccentric on the shaft, and thereby increase or decrease the supply of steam according to the load, and maintain uniformity of speed. The springs simply hold the weights in position. The dash pots prevent sudden changes. This engine is economical and effective. H. P. Gregory & Co., of this city, are agents for this Coast. All parts of the engines are built on gauges on the interchangeable system. The bearings are large and carefully fitted, and good material and workmanship are put in. These engines are made from 10 to 147-horse-power.



THE ATLAS AUTOMATIC CUT-OFF SLIDE VALVE ENGINE.

Miners hope that sampling works will soon be established at Prescott, Arizona, as they wish to sell small lots of ore. They are not prepared to ship carload lots, but they could keep a sampler in business. Regular reduction works would, of course, be preferable, but as they could not hardly be successfully operated without railroad facilities, sampling works are what they now want.

THERE are 12,973 newspapers published in the United States, a gain of 823 since 1884. Kansas shows the greatest increase, her gain being 78, Illinois coming next with 77. One newspaper is now printed for every 3,867 of population.

Steam-Engine and Boiler Practice.

The *American Engineer* of Chicago has issued two works, by Chas. A. Smith, C. E., both of which are very useful for all users of steam. One is entitled, "Steam-Making or Boiler Practice," the other is "Steam Using or Steam-Engine Practice." They are illustrated, well printed and serviceably bound.

These two books, companion volumes, represent the work of the closing days of the life of the late Prof. Chas. A. Smith. The books are characteristic of the author, being practical treatises for practical men, stating in a short, clear way the points to be avoided and those to be recommended in the design of boilers and engines to give a maximum efficiency and economy in the making and use of steam. The chapter on "The Nature of Heat and the Properties of Steam," which appears in both books, contains a valuable table of the properties of saturated steam based on the pressure instead of the temperature of evaporation, as is usual, and the use of the table is explained in the author's favorite manner—by example. The chapter on "Combustion" which appears in "Steam-Making," is short, but the difficulties in the way of obtaining the full evaporative value of a pound of coal are clearly stated and valuable suggestions made. This chapter contains a tabulated record of over 650 boiler trials. The Professor takes up the different classes of boilers and discusses their good and bad points with characteristic impartiality. In "Steam Using" the chapters on "Valve Gear" and "The Quantity of Steam Which Might Be and Which Is Used" will be found of value to practical men, but particularly good is chapter V, which contains an account of the experiments of Messrs. Hirn and Hallauer, translated from the French. The Professor leaves open the much-debated question of the economy of compounding, for want of sufficient experimental data, but inclines to the opinion that for quick-running, high-pressure engines little or nothing is to be gained by compounding; but that for such engines, judging from the experiments of Messrs. Hirn and Hallauer, it is best to use a single cylinder unjacketed engine with superheated steam. The books contain acute and short descriptions of most of the successful patterns of boilers and engines now in use in this country and Europe. There are a good many typographical errors in both volumes which should be corrected in future editions.

Mr. Schlund took about $3,000 out of a small pocket in the Tiger mine, near Rich gulch, Calaveras county, recently.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

The True History of the Arnold-Slack Diamond Plant.

EDITORS PRESS:—As certain New York papers have lately shown a disposition to revive the memory of the ill-famed diamond fraud perpetrated on this community some thirteen years ago, seeking to connect the names of Messrs. Roberts and Harpending therewith in an odious way, it may be well to info m the public that both of these men have, by ths almost unanimous verdict of our people, heen acquitted of any discreditable ageucy in that business. I will not here give a detailed history of that miserable affair, nor even recite more than a few of the reasons on whicb this verdict is founded. The purpose of this writing will, in fact, be served by a single statement, which fully explains bow Messrs. Roberts and Harpending came to be at all connected with the originators of the swindle, and how they came to be victimized by them.

These gentlemen, as well as Arnold and Slack, were Southern meu, being all natives of Kentucky. The extent to which persons from the South arc apt to confide in the honor and integ. rity of each other is well known. The word of a friend or associate is never questioned. Any statement made by them is accepted and acted upon as truthful and reliable, a man's word being considered as binding as his written obligation. This sentiment, so prsvalent in that sectiou of the Union, had in the case of these parties been strengthened by a mining partnership running through a uumher of years, during which mutual confidence and good feeling had been preserved all round. Many thousand dollars had been entrusted to Arnold and Slack to be sxpended by them in prospecting for, locating and working mines on joint account; a service which they had always performed to the satisfaction of tbeir partners, who had, in fact, ever found them in all respects truthful and trustworthy.

Little wonder, then, when these men returned, after a long absence in the mountains, and reported a great diamond find, that their unsuspecting partners should bave given ready credence to all they told them, previous rumors of the existence of precious stones in the regions visitcd by these bardy prospectors lending plausibility to tbeir cleverly concocted story. The readiness with which Harpendirg and Roberts consented to have tbeir stock locked up pending further investigation of the matter and aided in sending out a party to more carefully examine the ground and inquire into the reported find, shows bow thoroughly they believed in its genuineness and that everything was being conducted on the square. Had they themselves put up a job of this kind, they would have heen pretty sure to make money out of it; not being men likely to be caught in their own trap, however, they may in this instance have been trapped by otbers. The truth is, no set of men connected with that nefarious business suffered so much as Harpending and Roberts, they having been badly damaged in purse and, for tbe time being, injured in reputation as well. Out of their diamond shares these men could have cleaned up a million or more. That they failed to do so, and even sustained heavy loss, proves tbat they were in no way implicated in the fraud. Finally, I may say, that I know of my own knowledge that I have in tbe foregoing explanation. furnished the key to their blunder, Mr. Janin, the cxpert, having, through the same sort of misplaced confidence, been thrown off his guard and betrayed into a mistake that otherwise would not have occurred.

HENRY DEGROOT.

San Francisco, May 21, 1885.

MANGANESE.—A number of years ago traces of manganese, a metal used in steel-making and mining, were found on the ranch of C. A. Ellis, near the Livermore coal mines, seven miles southeast of Livermore. Samples were assayed, ranging in richness from 30 to 60 per cent, but no further action was taken in the matter. Some three weeks ago, bowever, John Taylor, senior member of the firm of John Taylor & Co., wholesale dealers in miners' supplics, of San Francisco, came up to Livermore to look up a supply of manganese, for which be has an active demand. A trip was made to the place and the lode examined, a sack of sample rock being taken to the city for assay. Tbe rock selected was below the average in sight, but assayed thirty-six per cent—a result whicb justified Mr. Taylor in ucgotiating for the use of the mine. He therefore contracted witb Mr. Ellis for the right of working the lode, making a contract for five years, in which he agrees to pay a royalty on all ore taken out. There are but two wholcsale dealers in manganese in this State, John Taylor & Co. and Justinian Caire, tbe latter being the owner of the old Ladd mine in Corral Hollow, from which many thousand tons of metal have been taken for bome use and shipment to England. Messrs. Taylor & Co. are now equally as well provided with a supply, while their mine is much better located as regards ease of transportation.—*Livermore Herald.*

Working Ore at the Freeland Mine.

The Idaho Springs (Colo.) *News* gives an article on the Freeland mine, from which we make the following extract:

"The Freeland mine has started in as a steady dividend payer. The property is making a net profit each month, over and above all expenses, of $12,000 to $15,000. Considerable has been said from time to time about wby this great mine did not pay divideuds before; but when we take into consideration the various reasons it sets to rest all questions of the whys and wherefores. First, for a few years back the mine was paying to the railroad company most of their profits in freight. Several conferences were had with the railroad officials, but witbout success in obtaining reduced rates. The manager, Colonel Osbiston, came to the conclusion to close down the mine—all but development work—and over 200 men were discharged. Things went along in this manner some months, until Mr. John M. Dumont, of Idaho Springs, a well-known mining man, built a smelter and took a year's contract to smelt the Fresland ores, which had been accumulating for nearly a year, and the undertaking proved so successful that the manager negotiated for the purchase of the smelter at once. This necessitated almost a total closing down for several months, until Mr. Dumont had worked up the surplus ore, when the works were purchased by the Freeland Mining Company, which necessitated a large outlay of money. At the sams time large engines, air-compressors and boilers were purchased and sinking upon the vein commenced and continued for a year or more; levels run, stopes started and everything put in readiness for a large production. A large outlay of money attended all tbis. Tbis is exactly the standing of the Freeland mine up to a few months ago. They have been producing largely, and after paying all expenses have put in the treasury $15,000 each month for dividends. Tberc are $80,000 ready to pay them. The ground opened up at present, if not another foot of development work is done, will run the company for two years at least, but drifts are being run ahead, day and night, and new ground opened up. Whils the average yield of its ore is less per ton than in many silver mines, the great width, uniform tendeucy and seemiugly limitless extent of the mineral body entitle it to a place in the front rank of the best of mines. The vein is mainly composed of copper and iron pyrites, with occasional bodies of nsarly pnre galena, carrying 65 per cent of lead and about 50 ozs. of silver. Nearly 90 per cent of the product is in gold, the remainder heing credited to the silver and cop per. From 1 to 3 per cent of the ore is composed of the latter metal. The ore is usually in the shape of a vein of copper-iron, rich enough to ship to market, flanked by poorer material and mixed mineral and gangue. The poorer grade requires concentration, from two and a half to tbree tons heing dressed down to one of salable mineral. Over one-third of the ore goes to tbeir smelter without separation. The cheapness with which this great vein can be worked is remarkable, and combined with its great size, renders it extremely profitable.

Owing to a scarcity of water the large mill for concentrating the orea of the Freeland mine only runs twelve hours a day. This is one of the best and largest mills of the kind in tbe State. Here the valuable mineral is separated from the gangue or waste rock, and from two and a half to three tons are concentrated into one, at a cost of less tban 70 cents a ton. The building is 117 feet long by 62 feet in width, and is divided into three compartments. Tbe ore comee direct from tbe mine, through tbe Freeland tunnel, into tbe ore-room. Here it is screened and tbe coarse portions sent through Blake crushers and Cornish rolls. It is then elevated to tbe receiving screens and sized, all of the coarse particles being passed back to other rolls, which crnsh to the desired sizes. The crushed material continues on tbrough a succession of cylindrical sizing screens to tbe last jigs, and is then ready for the smelter. Thesc jigs, of wbich there is a large number, are inclined wooden troughs, bottomed witb wire screens, through which water is constantly forced upward by the aid of a plunger worked hy an eccentric, thus lifting and keeping the ore and pulp in motion. By this means the heavier portions, containing the valuable metals, gradually work their way to tbe bottom, while tbe lighter, or non-mineral matter, are carried away by the flow of water. The former are called concentrates, and vary from the fineness of sand to the coarseness of wheat kernels. The jig-room occupies much of the larger part of tbe building. Steam power is afforded by a hundred-horse-power engine, driven by twin hoilers, located in a room set apart therefrom. The entire structure and its contents are of the most substantial character. Just above this mill, say one-balf a mils, is the smelter. This is constructed on the same plan as tbe works of the Boston and Colorado Company, at Argo, with the exception tbat they do not refine their own hullion, but only matte the ore; that is, they put so many tons of ore in one ton of copper matte, and this ie sold to the Argo works. The average value per ton of the matte will probably be from $700 to $900. The smelter covers an area of over an acre. There are two matting furnaces, five calciners, nine roasting kilns for desulphurizing coarse ore, two Dodge rock-breakers, two sets of Cornish rolls and screens. The works are run by a 35-horse-power boiler and engine. Tbe whole works are covered by substantial buildings, roofsd witb corrugated iron. There are 800 cords of wood consumed each month. Ths assay office is the most perfect of its kind in the State. Few mines are as closely tested as the Freeland, and few managers are as correctly informed of the true value of their ore product and resources. Every fathom of ground is examined by practical miners and experts of the company, and their invsstigations and assays tell to a certainty the kind of ground tbe levels and stopes are penetrating.

Here is a little world in itself. Scores of msn have employment, and with their families have built a town of over 500 inhabitants, witb storss of all kinds, school-houses and saloons, which go toward making up tbe clement. Here is a sermon for some philanthropist to work upon. What is the use of men wasting their breath in lecturing and writing books when a few gentlemen can take bold of a mine and, by expending money upon it, do good toward their fellow-men? There are plenty of mines around Idaho Springs whicb would make equally as handsome records had they the same amount of dsvelopment as the great Freeland.

English and Foreign Miners.

While on the question of efficiency, as estimatsd by the quantity of coal got, I will point out what I bold to be a fallacy in an argument founded upon it that is often put forward to serve a purpose. It is a commonly accepted opinion—at least in England—that the English miner is the most efficient workman; in other words, the labor of the English miner is more productive tban that of any other. To prove this, figures are appealed to, and if these alone can settle the question it must be admitted tbat the case is clearly made out. The statistics of production show that tbe English miner gets more coal in a year than any one of his Continental brethren. The next in this order of merit are the German, the Belgian and the French. Regarded solely from the point of view of coal production, the conclusiou is true, and so far an argument founded on it is valid. But usually it is employed to prove one of two things, either that the Englisb miner is capable of performing much more work than his Continental neighbors, or, whicb is only another view of the same thing, that the rate of wages in England is not really higher than the rates abroad, because it amounts to no more per ton of coal raised. Now, I maintain that the figures, which undoubtedly show the miner's productiveness in coal raised, do not exhibit his efficiency in work performed. The conditions in every coal field are different, and the conditions of the Continental deposits differ widely from those under which the English seams have to be wrought. The measures are frequently higb pitched and much disturbed and dislocated. The seams are frequently thin, or if thick, divided by dirt partings. The amount of "stone-work" in a Continental colliery is usually far greater than in an English mine. These and other influences of a like character operate to diminish the output of coal per man by rendering a large proportion of unproductive labor necessary. This work docs not appear in the statictics I have alluded to, but it is performed, and ought, of course, to be paid for. If the men could he compared hy the amount of work done instead of the quantity of coal got, the differences would appear much less than they do in that very ins ructive table lately published by Mr. Jeans. It may be that the order of merit would not be disturbed, but the differences would be notably lessened. Tbe Continental miner is a more ahle workman than he appears to be when judged by this false atandard.

Another error often fallen into in comparing English with foreign miners is to assume the manner of payment for labor the samc everywhere, an unwarranted assumption which makes the remuneration of the Continental miner appear less than it actually is. It is the custom all over the Continent to pay partly in kind. The miner ia provided witb a neat, comfortable and wholesome cottage and a good garden, sometimes free, but oftener at half-rent, and he is allowed as much coal as he needs for his own use. Bssides these, free schools and libraries are established and maintained mainly at tbe cost of the employers, who also contribute largely to tbe cost of medical attendance. Otber advantages there are, too, of the nature of pensions in some cases. All tbese must be taken into account when comparing the wages paid in money per week or per ton witb the wages of the Englisb miner for whom these advantages are not provided. It should be borne in miud also that these payments in a form other than that of wages do not vary with the fluctuations of trade. The importance of this fact makes itself felt in times like tbe present, when the state of the coal trade renders repeated reductions necessary. On the whole, the Continental miner, with his lower rate of wages, is better off than his English neighbor, whom he is apt to envy when he reads of so many sbillings a week more received. —*Cor. Colliery Guardian.*

Skilled miners are said to be leaving the Wood River country since the reduction of wages to $3.50 per day. They say even if they cannot get better wages in other places, the accommodations will be better and the surroundings preferable.

The Slate Formations.

The most casual observer cannot fail to notice order and design in the grouping and arrangement of rocks as they are expossd to tbs earth's surface. Soms of tbese sxposures suggest a building process on an elaborate scals. Sometimes, though rarely, ths exposure resembles a vertical wall—one layer of rock above the other; more often the structure is tilted or entirely upset, and apparsntly strewn at intervals on the surface, though still showing in many cases the same regular order. Sometimes the regular has tbe appearance of a solid mass, with no parallel dividing planes. These massive rocks underlie the otbers and constitute the first or foundation rocks of the eartb's structure. If all these rock exposures could be restored to tbeir original position, according to tbe order in respect of time in which they were formed, and the intervals properly filled out, the surface structure or crust of the eartb as far as can be studied and examined, would pressnt an upright pile of about fifteen miles in hight, with ths solid massive rocks which geology designates by tbe term "unstratified," at the bottom, and more regularly arranged layers or strata—and therefore called stratified rocks—above these. The former are also termed "igneous" rocks, on account of their origin being a consolidation from a fused or semi-fused condition, and having a crystalline or glassy appearance, which is tbe result of heat. The stratified rocks ars so called because divided into sheet-like masses called strata, and also termed sedimentary, being consolidated sediment, originally deposited by the agency of water at the bottom of some lake or sea. These strata are divided into groups, and subdivided into layers or beds and laminæ and distinguisbed by the remains of former life discovered in them, and hy a difference in mineral composition, more or less peculiar to each group. The various groups of strata are known by names which ars derived from ths mountains, lakes, rivers or towns, near which the gronp of strata are best developed and where they have been originally studied, as, for instance, the Huronian, Potsdam, and Niagara rocks. Some are named after their distinguished mineral-bearing characteristics, as tbe Carboniferous Limestone, ths Coal Formations, and tbe old and new Red Sandstone.

All ths stratified rocks are originally in a horizontal position. The tilting, folding and elevating process, which placed them in their present shapes and positions, were caused by disturbances, the result of earthquakes and volcanic eruptions brought about by the cooling off and contraction of the surface crust. It is evident therefore that highly plicated rocks, wben in the formation at the bottom of ths lakes or seas, extended over a mucb larger area, and lay at a much lower elevation.

The process of folding and tilting was accompanied by rising to higher elevation. Afterward came a process of crosion by floods, glaciers, and the elements whicb cut off and rsmoved the arches, filled up depreseions, cut out river channels and exposed the rock etructure as it is now found, thereby enabling tbe geologist to carry his investigation to a nepth of at least fifteen miles. Without tbese disturbances such investigations would necessarily bave been confined to very narrow limits, the science of geology limited in its scope to a few hundred feet of rock formations at most, and the valuahle metallic and mineral deposits which for ths most part are not found in the more recent formations, would bave forever remained lost even if the earth under such circumstances could have become inbabitable for man.

The older rocks, those located at the bottom of the geological pile, are called Archæan, or ancient rocks; the term Azois, meaning without life, was formerly applied to these rocks, but since the discovery in them of evidence of a very low form of life, called Eozoon, the term Eozoic is recognized. The Archæan or Eozoic rocks are subdivided into several groups, which it is not necessary to enumerate in detail. The principal and typical rocks of this period are granite, syenite and schist, the constituent minerals are mainly quartz, feldspar, mica and hornblende. The entire extent of their distribution is limited probably to not more than one-tenth of the earth's surface, but heneath they are supposed to constitute tbs great mass of the earth's crust.

The stratified or sedimentary rocks arc distributed over about nine-tenths of the dry land, and they cover tbe wbole of tbe sea bottom. They are represented by the sandstones, grit stones, conglomerates, shales, slates, chalk, limestones, marble, muds and clays. Ths formation of rocks and rock structure is in process at the present day; stratified rocks are being laid down in all lakes, estuaries and seas, and unstratified or igneous rocks are ejected from volcanic centers. And since the forces by which old rocks are wasted and new ones reconstructed from tbe debris are enduring the geologist is entitled to ascribe the formatiou of the rocky crust to the operation of similar agencies in former periods.

In this way land and water have been gradually but continually changing places, and the rock matter formed during each period is not only the record of these changes, but an indication of the physical aspect of our globe at the successive stages of its history.—*Slate Trade Review.*

MECHANICAL PROGRESS.

A Silver Piston Gland.

A machine making company in New York City havo made quito a nnmber of heavy engineo for the mining districts of Mexico and South Americe. The machinery was peculiar, in tho fact that every piece had to be made in sections light enough to be carried on the back of a mule. Some difficulty was encountered at first in getting cylinders made up into a dozen sections, but it was a new caee of difficulty being the mother of invention, and was succeefully accomplished. When the mules are winding their way along the defiles of mountain fastnesses with part of a steam-engine on their backs, they occasionally slip over a precipice, and the section ie lost or destroyed; but each part is made to interchangeable sizes, so in such a case the nnmber of the lost piece ie eent to the maker and a substitute is forwarded to take ite place.

Tho machinists who go along to put these engines and machinery together have some trying calls upon their ingenuity to make temporary substitutes for missing pieces.

We hear of a case where the stuffing-box gland of the cylinder was found to be missing when tho engine was put up. They were anxioue to etart up, and the machinist made a gland from a piece of hard wood, but could not make it hold the packing. In the neighborhood there was, belonging to the company that owned the engine, a furnace for smelting silver from the ore. The machinist made a pattern, and had a gland of silver cast, and used it on hie engine for several months, till the missing gland wae replaced by a new one from New York.

To IMPART A MOTTLED APPEARANCE TO SHEET-IRON.—W. D. Wood, of Pittsburgh, Pa., has patented a new process of imparting a mottled appearance to the surface of planished sheet-iron. Two-thirds of a pile of sheets are reduced between chilled rolls, and one-third are reduced by soft rolls. The latter soon become roughened by wear, and impart a mottled appearanee to the ebeets. In packing the sheets in charcoal one eoft-rolled sheet is placed between two hard-rolled sheets, and the pack is then baked. The planished surface is then produced by heating and hammering. The mottled appearance of the soft-rolled sheets will in the final hammering be transferred in part to the hard-rolled sheets, while the mottling on the soft-rolled sheets will be diminished. A uniform mottled effect is thus said to be obtained which is not excessive in degree, and which approximatcs closely the appearance of imported Russian sheet-iron.

IMPROVED METHOD OF RIVETING BOILERS, ETC.—A patent has been granted in England for a method of riveting boilers, tanks and similar articles of light metal. Instead of riveting in the ordinary way, a strip of asbeetoe cloth or other non-combustible material is introduced between the eheets to be riveted at the seam, thus insuriug, it is eaid, a perfectly tight joint. Tbe method is further applicable in the use of rivets for corners which are slightly countersunk at the neck, a washer of asbestos being placed in the groove. The inventors also etate that the articlee in wbicb the asbeetos strip is used may be afterward galvanized or similarly treated so ae to be rendered non-corrosive. Tbis system of using asbestos in the joints of riveted articles has long been employed in this country, but we are unaware that galvanizing hae ever been used in connection with it to render tbe joints non-corrosive.

IMPROVED CHAIN LINKS.—A chain link made from a bar of steel covered with iron bas been patented by W. Gerhard, of Philadelphia, Pa. Tbe eteel is not made in a single bar, but in a series of parallel layers or independent plates separated from each other by iron. The whole is thoroughly consolidated and welded together by rolling. The number of steel plates employed depends upon the size of the link to be produced. In a link made from a 1½-inch bar, five layers of steel should be used. The steel should not constitute less than one-quarter nor more than one-half the metal of the entire link. Tbe inventor states that by his improvement the welding of the bar into links is facilitated, and that tbe strength of the link is mucb increased.

ELECTRIC ALARM FOR HOT JOURNALS.—A number of years ago Prof. Charles B. Richards, tbe inventor of tbe indicator bearing his name, wbile superintendent of Colt's (revolver) Armory, at Hartford, Conn., devised an electric alarm for hot bearings, which was applied to the journals on the shafting. By tbe use of a compound bar of brass and steel an electric circuit connecting to an annunciator in the engine-room was closed and rung an alarm bell and also displayed a numbered tag indicating the line of shafting where the heating occurred. Some of the details may not be precisely related, but the general fact of using the expansion of metals to give warning of heated bearings before cutting occurs is as stated.

AMERICAN STOVES.—The United States uses more etoves than all the rest of tbe world combined. There are 8,000,000 of them in use bere, costing the possessors perhaps $180,000,000. They range in size from little toy affairs whicb could be carried upstairs one under each arm by an ordinary man, up to colossal stoves intended for tbc summer hotels and wood burning districts which will do tho cooking for 100 persons. Their price is calculated by their weight. The founders sell them at ratee ranging from five to eight cents a pound, and the retailers at about fifty per cent advanee on tbese figures. One stove lasts on an average about five years. Some large founders ehow nearly 500 kinds. Many also make etationary and Baltimore heaters, wrought-iron and stationary ranges and and gas vapor stoves, but these are not considered part of the trade. The chief producing places are Boston, Troy, Albany, Cincinnati, Buffalo, St. Louis, Louisville, Philadelphia, Cleveland and Leavenworth. Stoves are exported to each and all of the foreign countriee with which we have a trade of any kind. When foreign manufacturers undertake to make a etove, they invariably steal an American pattern in preference to devising a new one.

EXPERIMENTS WITH IRON.—At the Stevens Institute of Technology it appears that Professor Thurston has for many years been experimenting in the Department of Engineering on the structural changes and crystallization of iron, and has made important discoveries with the aid of what is now known as an autograbic, recording, testing machine. When a piece of metal is broken, a pencil diagram ie perfected which exhibits clearly and accurately the strength, elasticity, ductility, elastic limit, and shock resisting quality of the metal tested. It was quickly discovered that the elastic limit of any metal—that is, the strain at whicb it begins to yield under gradually increasing loads—becomes greater after loads less than the breaking load have been temporarily applied and the piece tbue perceptibly strained. By repeated applications of increasing loads it was found that the elastic limit could be brought up nearly, if not quite, to the limit at which rupture occurs. Some industrial processes, like cold rolling, produce a like effect.

SEPARATING TIN FROM SCRAPS.—An apparatus for separating tin from tin scraps has been patented by J. H. Kolb, of Brooklyn, N. Y. It consists of a tank inclosing an open basket, which is supported a short distance above tbe bottom of the tank. The basket is surrounded by a coil of steam pipe. A dissolving solution, such as a mixture of nitrate of soda and caustic soda, is poured into the tank and the tin scraps are placed into the basket. Steam is then turned on, and as it circulates through the coil it causes the dissolving solution to boil and to act uniform'y on the tin scraps. The tin combines with the solution and forms stannate of soda. After the tin is thoroughly dissolved the eteam is turned off and the basket is lifted out of the tank and emptied of its contents. When removed, the basket and coil are tboroughly rinsed to clean them of any deposits. The solution is poured from the tank and evaporated to recover the stannate of soda.

REPAIRING A WET LEATHER BELT.—When a leather belt has been slightly injured by rain or by being wet in any other manner, it should be dried as much as possible, and laps that may have started be fastened by a little cement, the composition of which is as followe is furnished by Page Belting Company: Equal parts of good glue and Prussian gelatine dissolved in water and cooked in a tin vessel set into a larger one containing water. Do not allow the vessel containing the cement to set quite on the bottom. It should be cooked until it is quite thick and ropy. It can then be worked into the places when the laps are started, by means of a knife. The belt should be bammered until dry, and a few pegs may be used, whicb you can get from a sboemaker; cut the pegs off a little from the surface of the belt on the reverse side, and hammer tbem down on a flat-iron or anvil or lap-stone.—*American Manufacturer.*

REGARDING HAND SAWS.—Stiff blades are made of better material than thick ones, and are less liable to "buckle" or "twist," and are not so apt to break. They require less set, will etand an edge longer, and are not so tiresome to work. They should be hung in plain beech handles with rivets flush or countersunk. The blade should be of dark color and have a clear, bell-like ring when struck with the ball of the finger. Blades of a light, iron-gray color are not so good. Never take a saw that jars or trembles in the handle. The first point is to grasp it by the handle and see that it hangs right and tbat the handle fits tbe hand properly. Then try tbe blade by springing it and see that it bends regular and even from point to butt. See that it has a good crowniug breast. Hold it at a distance and get a proper light to strike on tbe blade and you will see if there is any imperfection in grinding and hammering.

A NEW MOTOR.—The Hock motor, a new Vienna invention, consists of an air-tigbt furnace, whose fire is fed by compressed air; water is injected into the resulting gases of combustion, and tbe mixture of eteam and combustion products—called "air steam"—is lead directly into the engine. Tbere is thus presented the fact of machinery without a boiler, and the results of trials made with this arrangement are pronounced in the higbest degree satisfactory. Tbe macbine of 6 normal horse-power developed 12.23 effective horse-power, with a consumption of coal of 2.2 pounds per hour for eacb effeetive horse-power.—*Iron Trade Review.*

SCIENTIFIC PROGRESS.

The Sense of Taste.

The tongue is not the only organ used in the enjoyment of this seuse, and, alone, it is scarcely capable of appreciating delicate flavors. The differenee between salt and sugar, when placed on the tongue is hardly perceptible, provided the tongue is not allowed to touch the roof of the mouth and the lips. Indeed the act of getting the full enjoyment of a flavor, commonly called smacking the lips, consists in bringing the tongue into contact with the roof of the mouth and the lips. By this act the substanee to be tasted is spread over the surfaces of these parts, particularly of the tongue, and mixed with the saliva.

Just how this act produces taste ie not exactly known; but we do know that the tongue is covered with two layers of skin, the lower one thick and filled with nerves, and the upper one thin and porous. The nerves in the lower skin are the nerves of taste, and probably are set into vibration by the substance tasted, very much as the exquisitely sensitive nerves of the retinæ are affeeted by light, or the nerves of the ear by sound. At all events the sense is conveyed to the brain, where we involuntarily distinguish between pleasant and disagreeable tastes.

The nervcs, moreover, of the tongue, are not all alike. In the tip of the tongue they are clustered together more closely than at the back, and transfer to the brain a diffsrent sensation. For instanee, a little powdered alum placed on the back of the tongue tastes sweet, whereas on the tip it tastes acid.

The sense of taste is an almost certain guide to the wholesomeness of foods, and a monitor which warns us when we are in danger of swallowing any injurious or poisonous substance.

Poisons, as a rule, are extremely disagreeable to the taste, and it requires an effort to overcome the natural repugnance to them. Hence it is that accidental poisoning so rarely occurs.

In the case of foods, we soon tire of a thing as a regular diet, and the taste craves a change. Here the whole system rebels against the monotony of diet, because no one food is likely to contain all the elements of nutrition required by the body for the exercise of its functions, and soon the elements which are in excess cloy upon the taste, because the system is already supplied with them, while we crave the foods containing substances which the system lacks. A change is then demanded by nature and made manifest by the sense of taste.

If the change cannot be made nature sbows her disapproval by causing a loss of appetite or a repugnance to the condemned article of diet.

Again, in the case of foode which are much concentrated or have a strong flavor, like preserved fruits or syrups, the taste eoon becomes dulled to the pleasure of their eweetness, because tbe delicate nerves which convey the impression of sweetnees to the brain become fatigued and fail to respond to the exciting cause.

There seems to be also a set of tastes which are in some degree complementary to each other. That is, if we taste of some intensely sweet substance we cannot detect a less degree of sweetness until the nerves have recovered from their first impression; but we can appreciate keenly any acid flavor.

To illustrate this take a glass of lemonade, which contains substances desigued to produce botb sweet and acid tastes. If before drinking it we eat a lump of sugar the lemonade will taste sour; but if we take a little clear lemon juice first the lemonade will taste like sweetened water.—*Exchange.*

THE ORNITHORHYNCHUS is tbe unpronounceable name given to a queer little animal recently found in Australia, and wbich, it is claimed, forms a perfect connecting link between birds and mammals. It looks like tbe beaver, but instead of having hair on its back it has scalee, and in place of scales on its tail it has bair. This in itself would not constitute a missing link, but after long investigation we find, says Dr. Ward, that it lays an egg like a bird, but suckles its young like a mammal. Its habits are like the beaver's, but it is an utterly heterodox creature, and entirely the most unnatural known. The animal was figured in the *Scientific American* of March 15, 1884. Dr. H. A. Ward, an attache of the American Museum of Natural History, of New York, bas recently returned with several live specimens of this animal for the zoological department of the museum.

ORIGIN OF COAL.—One of our contemporaries, the *American Architect*, some time ago called attention to tbe general admission by geologists that all coal beds once formed the bottoms of lakes of fresh or ealt water, and it is thought tbat this fact indicatee an explanation of the production of coal which will remove tbe difficulties of the old theory. It is hardly conceivable tbat wood, especially through tbe loss of its hydrogen, should ever become converted into a substance plastic enough to flow like a river, taking the impression of objects along its banks; but it ie not difficult or unreasonable to suppoee instead of this, that the stagnant lakes of the coal districts were, ages ago, when the temperature of tbe earth was higher and vegetation more luxuriant than now, filled with little plants whicb even now sometimes discolor our drinking water, and that these, dying and settling to the bottom, may in time have so accumulated as to form a layer of carbonaceous mud of considerable depth. Something of the kind still goes on in such ponds, the bottoms of whicb are usually covered with a light, black mud, while tbe bubbles of carbureted or phosphureted hydrogen which rise when this mud is stirred show that it is in process of conversion into something at least very similar to coal. Such mud, if it could be supposed to accumulate undisturbed, would present, perhaps, all the qualities necessary to fit it for conversion by decomposition into coal. The presence of certain salts and mineral substancee which are often found in coal-ashes, but never in wood, might be due, on this theory, to impurities dissolved or suspended in the water of the carboniferous lake, and even the formation of petroleum, naphtha and bitumen, in connection with coal, is at least as easily explained by this hypothesis as by the old one.

Separation of Oxygen by Means of Silver.

Troost has recently demonstrated that metallic silver allows oxygen gas to pass through it at a red heat, in a manner similar to the passage of hydrogen through red hot platinum or iron, which was proved some years ago by Deville and Troost. For tbe experiments a tube of silver was used witb a diameter of 1 cm., the thickness of the metal being 1 mm. This was inclosed in a rather larger tube of platinum. When the tubes were heated, and oxygen gas was drawn through the space between the tubes, it was found to pass into the silver tube. The amount passed corresponded to 1·7 liters per hour for every square meter of silver surface. If air were passed between the tubes instead of oxygen, then it was found that practically only oxygen found its way through into the silver tube, as only traces of nitrogen accompanied it. The rate of passage was, however, very much diminished. These experiments were carried on by exhausting the silver tube by means of a Sprengel pump, but it was also found that it was not necessary to thus exhaust, as the simple passage of some other gas through the tube, such as carbon dioxide, was sufficient to cause the transfusion to take place, though at a considerably less rate than exhausting. When a silver tube of less thickness than 1 mm. was used, the rate of transfusion was increased. Various other gases were passed between the tubes, but tbey only passed through tbe silver at a very slow rate. It is suggested that this quality of silver, of allowing oxygen to pass with comparative ease, may be some day made use of for isolating the oxygen of the atmosphere, for which purpose a very large surface would be required. Large coils of tubes with thin metal could be used, with either an exhauster or a current of carbon dioxide. If the latter, the carbon dioxide could be absorbed in alkali, leaving free the oxygen.

WEIGHT AND COMPOSITION OF THE ATMOSPHERE.—One hundred cubic feet of nitrogen weighs, at a temperature of 32° Fahr. and a pressure of 15 pounds per square inch, 80 pounds; oxygen weighs 90 pounds; the mixture of 770 pounds of nitrogen and 230 pounds of oxygen makes 1,000 pounds of common dry air. As the oxygen is heavier, it occupies less bulk in proportion, so that if we take the air by bulk, 790 cubic feet of nitrogen and 216 of oxygen makes 1,000 cubic feet of air, which will weigh 82 pounds. The amount of watery vapor is very variable, changes from hour to hour, and differs in many localities; but the small amount of carbonic acid is less variable, and changes only from 1-2,500th part to about double that amount. Notwitbstanding it is witb water the important element required for tbe nourishment of vegetation, whicb could not thrive in an atmosphere only made up of oxygen diluted witb nitrogen.

A NEW PROCESS FOR CHLORINE.—A new process of making chlorine bas been described by *Le Genie Civil* as the invention MM. Pechiney. It consists in the addition of magnesia to a concentrated solution of magnesium chloride, so as to produce a solid mixture, whicb is then treated with air and heat. Nearly the whole of the chlorine is liberated, a part ae free chlorine and a part as hydrochloric acid. The residue consists of magnesia, which is used over again with a fresh charge of magnesium chloride.

THE ANCIENT QUARRIES OF THE PHARAOHS.—News has lately been received at Vienna concerning the last journey of discovery of Dr. Schweinfurth. He explored the eastern desert track between the Nile and the Red sea, where granite quarries have existed since the time of Trajan and Hadrain, and he made a new plan of this locality, which will assist us to a knowledge of the way in which the Pharaohs built and kept in repair their great prison in the midst of the Desert.

ARTISTIC PHOTOGRAPHY.—One of the finest and most picturesque scenes yet produced by the camera, saye a New York contemporary, is a flock of sbeep grazing on the campus in Central Park. There ie a pleasing variety in the attitudee of the animals, and although tbe number is large, each is a perfect portrait. The picture forms a study for the artist. The negative wae made by a member of tbe New York Society of Amateur Photographers.

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Passing Events.

In several places in this State where surface mining is carried on the water has given out and the men have practically quit for the season.

There seems to be a very general demand in various parts of the mining regions for sampling works. Where these have been established they have greatly benefited the miners, who by their means are enabled to dispose of lots of ore, and continue work. A camp with a few hundred men working on their own claims is apt to be more prosperous than any "one mine camp."

The northern counties of the State continue to attract many miners, and considerable prospecting is now going on. The traveling representative of the PRESS, now in Northern California, will soon send for our readers a series of descriptive letters concerning the mining regions thereabouts, which will give a good general idea of the country as a mining field.

SUPERINTENDENT A. ARENTS, of the Mount Corey, has made prospects brighter for Coryville, Nev., by letting a contract for prospecting work in the mine. Good miners think there is an excellent chance to uncover another large body of ore.

FOR the last quarter the bullion yield of the Alice (Butte) mine was nearly $300,000.

A Mining Law Reminiscence.

At a reception given to Hon. John Sherman, of Ohio, by the Chamber of Commerce, Board of trade and Manufacturers' Association of this city, that gentleman in speaking of California said that "the mines of this State have added a great chapter to our laws."

It may not be generally known, but it is a fact that the first bill concerning mining laws, after California mining interests needed general lawe, was introduced in Congress by Mr. Sherman, of Ohio. He also introduced the third bill, Mr. Julian introducing the second. If either of these had been passed, the Pacific States and Territories would have received a blow from which they never could have recovered. The Government could only have receded after the most irreparable and widespread damage had been done.

At the commencement of the 39th Congress there was a strong disposition, not only in Congress, but throughout the East, to make the mines pay the national debt. The idea of relieving the nature of the payment of the immense taxes which the war had saddled on us by the sale of the mines on the far distant Pacific Slope, was the most popular ever started. Compelling other people to liquidate your obligations has always been a highly comfortable and popular proceeding.

The first bill on the subject was introduced by this same Mr. Sherman, of Ohio, and Mr. Julian, of Indiana, introduced another. Both of these bills contained the most odious features. The fact of Mr. Stewart being on the committee to which they were referred stopped them, though the Julian bill was more favored, the House passing a resolution substantially endorsing such legislation. The Secretary of the Treasury was then one of the strongest advocates of the sale of mines, and appeared to be under the impression that it would yield a large revenue. Mr. Conness suggested to him—when it was thought a partial success of his views would be more satisfactory than an entire defeat—that a bill should be prepared in his department. The Secretary then prepared a record bill, introduced by Mr. Sherman, which was a great gain on the first bill, but still very bad. Mr. Conness and Mr. Stewart, of the Committee of Mines, drafted a substitute, which, after several weeks of close study, resulted in what finally became the general mining act of July 26, 1866, granting titles in fee, which remained in force until the law of May 10, 1872, under which we now work.

This 1866 law, when drafted, was considered an advanced affirmative position, from which the granting, selling, or other calamitous disposition of the mines could be successfully withstood. But when it first came up it only had two warm advocates, Messrs. Stewart and Conness, of this State. Sherman had a great deal to say in the debate, for he still clung to the idea of the Government getting a profit out of the mines. In fact, he was one of those who thought that even after the sale of the mines the Government should be a sharer in the proceeds realized from them. The bill had a curious title—"an act granting the right of way to ditch and canal owners, through the public lands, and for other purposes." The reason for this title is given in Gregory Yale's work on "Mining Claims and Water Rights," the first original contribution on American Mining Laws, published in 1867.

It will be seen from these remarks that while Mr. Sherman is gracious enough to concede that our State "has added a great chapter to our laws," the State is by no means indebted to him for said chapter.

For a great many years there was a sad deficiency of attempts to elucidate the principles governing the law of mining property. In the old States where mining property was held like other real estate, and where the Federal Government owned no land, the subject of mineral laws attracted little attention. Until the act of 1866 there was no general law which authorized mining upon the public lands, though we have been mining here for many years. In fact our experience made the laws, our miners originally framing them in simple but forcible terms, in the various districts.

The policy of the government from the early organization has been to reserve from sale all lands containing minerals—that is, all known mines. For forty years after the land system was established there were no means by which the title of land could be acquired except by purchase or special donation, and the sale of mineral lands was prohibited. After the lapse of that period, a proposed system of sale in favor of actual settlers called pre-emption was adopted, by acts of partial application, and gradually extended until ths system became general. This is only another mode of making a sale.

The reservation of mineral land continued under this system. Aside from the coal, lead and copper mines on the public lands in the Northwest there was nothing to attract the attention of the masses to the mineral lands belonging to the Government, and consequently the land system expended itself in the disposition of agricultural lands. The policy of reserving the mineral lands was dictated by the vague idea of some immense treasures at some day to be realized in the shape of revenue, and under this nurtured idea, grown sacred by tradition and proved fallacious by all established facts, the policy was never invaded until the act of 1866 partially extinguished it. The preceding remarks concerning the history of the act show how near the old system came to being perpetuated by legal enactment. Even then it was thought to be a great concession to California.

Upon the acquisition of this State and the exciting results produced by the gold discovery the Government found itself fettered by the ancient policy of reservation, more illiberal than the laws of the mediæva ages relating to mining. The attractive qualities of the metal, its abundance, the facility of obtaining it, the freedom from prohibitions, either by the local or Federal Government, induced the population flocking here from all parts of the world to adopt a system of mining regulations, chiefly traditional, but entirely voluntary.

Strange to say, the system was not only established without the authority of the Federal Government, but all mining upon public lands was at the time actually forbidden. The local Government was delayed in its organization, and was, when orgauized, powerless to act freely on the subject. The Federal Government refused to act upon this strange and unexpected state of things, and the State Government, to some extent, assumed the control of the mines. In so doing, as much from the want of power as experience, the attempt at a system was necessarily crude. The policy agreed upon was to adopt the same condition of things which the Federal Government itself was compelled to acquiesce in. Under these circumstances the laws established by the miners themselves became the laws of the State. For once in history the laws to govern a laboring class were made by the class itself.

The courts of the State followed the same principle; they were left without direction by legislative authority, except by implication, in determining the principles upon which controversies about mining property should be settled, and naturally adopted the code presented by the miners. In some instances, as in the case of water rights, the courts departed from the rules of common law, which under the general law of the State was the rule of decision.

Under these rules of action the multitude of precedents grew up which not only furnish the law for the State, but are a guide in all controversies on the mineral regions in the United States now so widely populated. It was probably this Mr. Sherman meant when he said the miners of the State had added a great chapter to our laws.

It was not, however, until as late as July 26, 1866, that the following significant sentence was incorporated into the statute: "All valuable mineral deposits in lands belonging to the United States, both surveyed and unsurveyed, are hereby declared to be free and open to exploration and purchase, and the lands in which they are found to occupation and purchase by citizens of the United States, and those who have declared their intention to become such, under regulations prescribed by law, and according to the local customs or rules of miners in the several districts, so far as the same are applicable and not inconsistent with the laws of the United States."

THE mining outlook in Plumas is improving. It is true that there is not the rush of five years ago, but what is being done is upon a solid basis. There is no doubt that the county sustained a great deal of damage from the operations of stock speculators.

California Manufactures.

It is rather satisfactory to know that California is constantly increasing its importance as a manufacturing State. As new people come here who have no inclination for agriculture or mining they look about for openings in other directions, and as a consequence new industries are constantly being started. It is true many of these are so far on a small scale, but as we grow in population these industries grow also. At the time of the taking of the census in 1880 the State of California had 5,885 manufacturing establishments of different kinds, employing a capital of $61,243,784. These gave employment to 38,327 males over 16 years of age, 3,922 females over 15 years of age, and 1,460 children and youths. The total amount paid in wages each year is $21,065,905; value of materials, $72,607,709; value of products, $116,218,973. This is a pretty good showing for a State which, from a manufacturing point of view, is supposed to be of little consequence. Since these figures were compiled there has been an increase in manufactures, and from this on we can expect a still greater number.

At the time of the census of 1870 the State had 3,984 establishments, with a capital of $39,728,202. They gave employment to 24,040 hands, earning $13,136,722 wages annually. The value of materials was $35,351,193, and the value of products $66,594,556. During the ten years we increased the value of our annual product nearly $50,000,000.

The city of San Francisco itself, the center of population, is also the center of the manufacturing industries of the Coast. There are in the city 2,971 mechanical and manufacturing industries, with a capital invested of $35,368,139. These employ 23,662 males over 16 years; 3,588 females, and 1,192 children and youths. The total amount they earn in wages each year is $14,928,534. The value of materials used is $47,970,072, and the annual product is worth $77,824,299. This shows that out of a total value of annual manufacturing product of the State of $116,218,973, San Francisco is to be credited with $77,824,299.

These are the latest reliable figures, yet they were compiled in 1880, since which time it is fair to conclude there has been some considerable increase. Some of our older manufacturing plants have been enlarged and a number of new ones added. Among other things we have a cotton-mill, an entirely new industry. On the Alameda side of the bay a number of new enterprises have been inaugurated, such as the Judson Iron Works, the glass works, nail works, cotton-mills, etc. An important addition on this side of the bay is that of the shipbuilding plant of the Union Iron Works, at the Potrero, where one metal steamship has already been built, and an equipment prepared for building iron and steel vessels. Fruit canneries have multiplied all over the fruit-growing regions, and small factories of various kinds are on the increase. All these things go to show that California is growing in many profitable branches of manufacturing industry.

The Silver Question.

At the reception given to the Hon. John Sherman by the business men of this city this week, that gentleman said: We want such an adjustment of silver and gold that they can be exchanged in the Treasury of the United States for money certificates, and should be able to pass, equal one to the other, over the entire civilized world.

The speaker said that the people of the East were not opposed to the production of silver, but they believed that the two metals should be equalized. He believed that if the present system were continued it would have the effect of demonetizing gold. If silver were purchased for the miners at market value, coined at market rates, and paid out at market rates, silver coins would be received everywhere. Commissioners had been sent to Europe to ask for the establishment of a universal ratio. The European nations had refused to agree, but we can compel them to adopt that ratio.

He prophesied that if his method of coinage were adopted there would be as great an effect produced as by the resumption of specie payment.

WORK is progressing in Granite District, six miles south from Bernice, Nev., and the mines are showing good ore.

The Wolf Safety-Lamp.

The development of coal mines has kept pace with the facilities at command for ventilatiog and lighting. In fact it was formerly customary to leave unworked those mines, or portions of mines, in which naked lights could not be used without danger. Attention was then turned to the ventilation; but even with improved ventilation, the naked light was often not safe. The new era in coal mining dates, we may say, as far back as 1815, when Sir H. Davy and Mr. George Stephenson discovered the principle of the safety-lamp. Since then many improvements have been added to their lamps, but until recently none can be said to have given entire satisfaction; and even now the question of more light is being agitated.

The difficulties to be overcome by improvers were many. Attention was first directed to the locks, with the view of making them more secure, and of preventing the miners from picking them to light their pipes, or from relighting the lamps in the mines in case they had been extinguished—such a proceeding being, of course, highly perilous in fiery mines. The improvement of locks was not found, however, to be perfectly effectual, since the miner could, by the aid of his picker raise the wick of the lamp to such a hight as to draw the flame through the gauze and thus light his pipe. Legislation then made the act of smoking in fiery mines a criminal offense; but even this did not put an entire stop to it, nor could it be guarded against, since the pickers were indispensable in order to raise and trim the wick. On the other hand, could all the miners have been convinced that in drawing the flame through the gauze, they put in jeopardy their own as well as the lives of others in the colliery, and thus persuaded to cease from the practice voluntarily, still the danger would not be entirely removed; for we have it from no less an authority than Mr. Darlington that sparks may fly off from the lamp when the picker is used, and that one spark would be sufficient to cause an explosion.

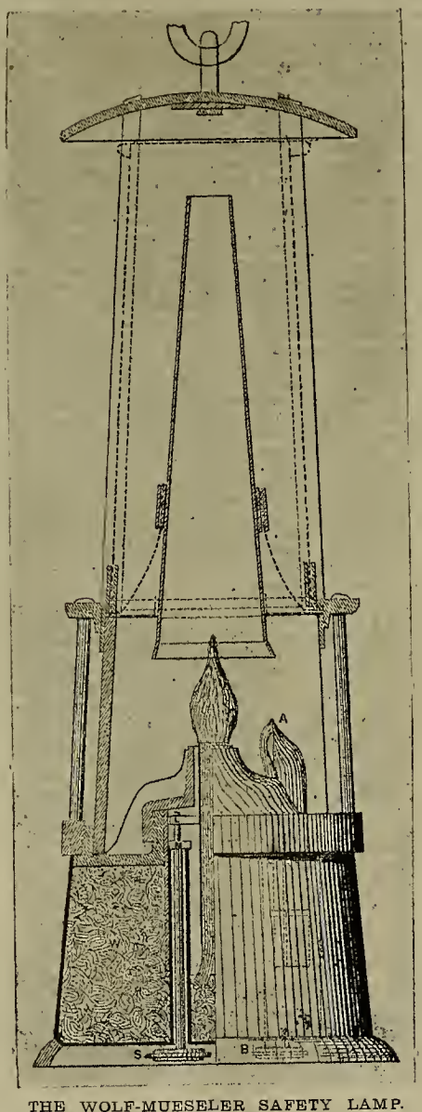
The next attempt was to invent a lamp which would not pass the flame through the gauze when moved rapidly. The Boty lamp on being immersed in an atmosphere highly charged with fire-damp becomes extinguished. But the miner thus finds himself in an unenviable position, since he cannot re-light his lamp, and must, consequently, remain in the dark or grope his way back to the fire-boss to have his light unlocked and re-lighted—a dangerous undertaking at best.

What was needed was a lamp, the lock of which could not be tampered with, the wick of which could not be raised, and which did not require a picker, and could be extinguished or lighted at pleasure without opening.

Such a lamp is the invention of Mr. Wolf, of Zwickau, Saxony, described before the American Institute of Mining Engineers by Eugene B. Wilson, of Drifton, Pa. A friend of Mr. Wilson's brought one of them from Germany last fall, and it has been greatly admired for its simplicity, efficiency and safety. The accompanying drawing shows Wolf's improvement as attached to the Mueseler lamp, which was considered by the Belgium Commission of 1868 to be the best, and the use of which was again made obligatory by a royal decree in Belgium in 1876, as it had been also in 1864, before the Commission re-examined the question. The Mueseler lamp is, like the Clanny, a modification of the Davy, in which a glass cylinder is interposed between the wire-gauze cylinder and the body of the lamp, so that the light of the flame is not diminished by the wire. The Mueseler lamp has, however, also a sheet-iron chimney inside the gauze, which is said to have the effect that the light is extinguished by a strong draft or by an oblique position. The Mueseler lamp burns vegetable oil. The Wolf lamp, on the other hand, burns benzine, which is less expensive, gives a brighter and more uniform light, and does not deposit soot. The consequence is that a much finer wire-gauze can be used, with great increase in safety; and the miner does not need to pick his flame or clean his lamp during the shift, the wick being made of mineral wool. The opening of the lamp is prevented by a lock which is operated by a magnet; and as it is not necessary to open the lamp to re-light it, all legitimate occasion for doing so in the mine is removed.

The body of the lamp, *W*, which contains the benzine, is packed with mineral wool to prevent spilling. Thus held the benzine is itself no source of danger. The flame may be made larger or smaller, to a limited and not dangerous extent, by the screw, *S*, working in the collar, *M*. The arrangement for lighting is not clearly shown in the drawing. It is similar to that which is so commonly sold by tobacconists for lighting cigars, consisting of a tape carrying at intervals small percussion-wafers. The dotted lines between *A* and *B* indicate in a general way the position in the lamp of this arrangement. The button, *B*, operates both the feed of the tape upward (bringing a fresh percussion cap to the point of ignition, *A*,) and by means of a spring, not shown, the trippiug of the lever which explodes the cap. This lever is shown in the drawing in contact with the tape-holder at *A*, as it would be just after the explosion of the cap.

In Serlo's *Leitfaden zur Bergbaukunde*, the



THE WOLF-MUESELER SAFETY LAMP.

above-mentioned advantages of the Wolf lamp are enumerated (but no drawing is given); and it is added that the lamp is said to go out when dangerous proportions of fire-damp are present, and also to burn in "bad air," long after oil-lamps have gone out. It certainly seems to the writer to be the nearest approach to a perfect safety-lamp which we have at present. There is, of course, yet room for invention. We want more light, and better instrumental means of warning when fire-damp is present.

THE PACIFIC COAST PRESS ASSOCIATION will have its mid-summer excursion this year from June 16th to June 20th. The members will visit Napa Soda Springs and vicinity. During the trip, excursions and picnics will be made into the mountains in the vicinity, also Oak Knoll farm, Krug's vineyard and St. Helena, aggregating in all some 45 miles of drives. Three days will be spent at and in the vicinity of the Napa Soda Springs. A number of musicians will attend this year, and a concert will be given.

STATE Mineralogist Hanks expects to start from New Orleans with the State collection of minerals by the last of the present month.

Foundry Notes.

The Pacific Iron Works have been reasonably busy of late, though not by any means running their full force.

Among the jobs recently turned out may be mentioned a 20-stamp silver mill and heavy hoisting plant for a mine in Central America; a 15-stamp silver mill for Chihuahua, Mexico; a 20-stamp gold mill for the Amador Queen mine, Amador county; a 10 stamp gold mill for the Utica Mine at Angels, Cal.; three large Bruckner chloridizing furnaces for Mexico; one 50 horse power Wheelock Automatic cut-off engine for the State Printing Department at Sacramento.

This firm still have the call on smelting furnaces, not only for the home demand but for many distant localities. They have recently supplied the new Selby Smeltiog Works with a 40-ton furnace and equipments, together with refining kettles, hydraulic elevators, etc., and have shipped four smelting plants to various mines in Australia.

The Duncan concentrator made by this firm seems to be attracting much attention and commanding large sale. Among the Mills recently equipped with them are the Amador Queen, Amador county; the Utica mill, Calaveras county; the Maxim mill, Inyo county; San Augustiu mill, Sonora, Mexico.

THE ELECTROLYTIC COMPANY, formed in this city last week to work the various patents issued to Dr. J. H. Rae, will probably engage in more varied work than was at first anticipated. The company, besides manufacturing the electrified quicksilver for amalgamation purposes, will also as soon as practicable, proceed to erect works to manufacture copper from copper matte, black copper, etc., by an electrical process. The laboratory of the company is at 35 Market St., where Dr. Rae is manufacturing and exhibiting the electrified quicksilver and other products. By recent improvements the prepared mercury can now be sold for $1 per pound, whereas by the old process, it cost $3. It is put up in 6-pound boxes.

Miners' Lore.

[Written for the Press by F. W. S.]

Cheap labor in mines is not economy. Those who have tried it don't need this advice.

The miner who misrepresents his property for the purpose of making a sale is a bad man for a camp.

The last thing needed in a new district is a mill or smelter, yet these are invariably wanted first by prospectors.

Theory looks well in print and sounds seductive to the ear; but it does not pay as well as practical demonstration.

Lease your mine to responsible parties if you are not able to work it yourself. A mine will bring you in more working than lying idle.

Be careful what mining machinery you buy. Find out to a certainty what treatment your ores need before contracting for machinery.

The miner whose experience has been confined to one district knows about as much about mining as a new German emigrant does about the English language.

A thorough knowledge of the mining laws of a district is the resident miner's most important duty. A defective title to a mine often causes more trouble than a bad deed to a farm.

A business man buying goods buys the latest styles and most improved manufacture. Old styles are not touched, no matter how cheap. Mining men who contemplate buying mining machinery should do likewise.

Many good claims are abandoned by miners who do not keep sufficiently posted on mining matters to know that oftentimes a low-grade ore can be increased to a high-grade by concentration. A good concentrator on an ore that averages $8 to $20 per ton will run it up to hundreds.

The plan of sinking a 10-foot hole in the softest place that can be found on a claim and of doing assessment work in like places is a mistake. Develop your prospect as you go. If the showing is not good enough to open it up properly it ain't worth locating.

Miners and mining men should hold meetings occasionally in their districts and discuss the mining laws that govern them. Bad laws could be revised and recommended for legislation. The practice of such meetings would result in much good to both miners and mining.

Do not be so vile as to take a man's mine that is worth $100,000 from him for one or two thousand, just because he gives himself away as having such a mine and is hard up for money. It would be unchristian-like on your part, and you can rest assured that he is a high-grade liar who offers a property of that value for so little money.

Studying books on mineralogy and stuffing yourself with jaw-breaking, technical mining terms, without some practical knowledge of mining, is of but little value. Miners with experience can learn a great deal by reading books on the treatment of ores and the characteristics of mineral-bearing formations. A miner without a good book on mining is worse off than a farmer who don't take a newspaper.

Coast miners would find it profitable to have an occasional correspondence with smelting companies of standing and experience such as the Selby Smelting and Lead Company as to the treatment required by their ores, what such ores are worth, and inform themselves in such matters. Often times the output of their mines would be of value to a smelter and pay a handsome profit to ship. The more a miner knows about ores and their values the shorter will be his days of hard work and poverty.

In most California mining camps the assayer finds but little to do. The consequence is that many a good paying claim is passed over by the miner, in search of that in which he can see mineral. If miners in the gold districts of California were to keep as frequent a record of the value of all kinds of ores taken out of their mines as the miners of a silver district do, they would know more about the different formations and in many cases new bonanzas would be discovered that are now passed over as N. G. Test your rock. You might as well try to read in the dark as to mine without using the assayer.

In no industry are so many sign boards, as it were, to guide the inexperienced from mistakes as in mining. There have been more monumental failures in mining and milling than in any other industry. The blunders of the past are legion, and in nearly every old mining district the mistakes in working mines or the erection of useless machinery stand as an eloquent "be careful" to the miner of to-day. There is less danger of being stranded in mining now than in any other calling, if it is entered into with the same caution and business-like methods and economy as practiced in merchandising or other legitimate business. Science and business will beat luck and chances every time.

Arizona.

Graham County Copper District.

[From our Traveling Representative.]

The largest copper district in the Territory is in Graham county. The magnitude of the workings of the copper mines in this district is known hut little outside of the immediate vicinity. The copper helt runs almost parallel with that of a gold-bearing formation; the latter lying along the west hank of the San Francisco, while the former lies some few miles distant from the river and higher up on the mountains.

The Great Copper Camp.

Clifton is the headquarters of the great copper interests of Graham county. It is the northern terminus of the A. & N. M. railroad. Situated on both hanks of the San Francisco, the place is one of interest to hoth miner and tourist. The town is picturesque as to location and surroundings. The offices of the railroad, the smelter and great huildings of the Arizona Copper Company keep the place up and it is doing a good business. During the days when copper was "up" Clifton was a lively as well as a tough place; it is not overly Godlike in appearance as yet, there being among the lower class many running gears of ill-spent lives, some of which defy competition in pure cussedness and Apache Indians in gentleness. No churches grace the towu. What religion prevails in camp is brought in, and when the supply is exhausted another installment is ordered.

The Arizona Copper Company.

This company is a Scotch corporation with headquarters in Edinhurgh, Scotland. They have the immense sum of $5,500,000 invested in mines, smelters, railroads, iuclines and machiuery. Duriug the early history of these mines the miningof ores was very expensive and the handling of the same was slow and limited, having to haul the ore several miles in wagons. A declining market compelled the contrivance of labor-saving machinery that lessened the cost and increased the output. Each succeeding year the steady decline in the price of copper caused additions to and more perfection in the different departments until the present date shows one of the finest plants and hest equipped copper mines on the Coast. This company has four groups of claims, 66 in numher.

Copper Deposits.

The copper-bearing formations lie more horizontal than otherwise. The mineral occurring in hunchy deposits and in long, chamher-like beds in lime formations on a quartzite-porphyry contact. Near the surface the deposits cousist generally of carhonates, associated with oxide of manganese, the same running ou an average of 15 per cent copper. A depth made of iron carhonates associated with a red oxide of copper increases the grade to an average of about 25 per cent copper. The ores of this district are mostly all self-fluxing, some of them sufficiently so to flux more than themselves. While occasional deposi's of nearly pure native copper are found, uo large hodies of such are discovered. The average of the ores of the district can safely he put at 18 or 20 per cent. No great depth has heen reached in any of the mines, as most of the work is done on the contact which lies more or less horizontal. Deep copper mining in this district has not proved as favorable as closer to the surface. No trouhle is experienced from water, in fact, it is a costly necessity. Little or no timbering is required in the mines. The ground is easily worked.

The Two Companies.

Alongside of the Arizona Copper Company are located the mines of the Detroit Copper Company, a New York concern. The latter company's interests are not to be compared with the Scotch people's as to magnitude or liheral husiness-like method of working. The mines of hoth companies lie side hy side on the summit of a high range of mountains at an elevation of nearly 2,000 feet ahove running water—the San Francisco river, six miles distance. The Detroit Copper Company controls the water supply on the hills; hence the friendly relations of the two companies.

A Dizzy Railroad.

From Clifton a 20-inch gauge road clings to the side of or runs on trestles over the bed of Chase's creek, a distance of about 10 miles. The grade averages four per cent with numerous 42-degree curves. The cars are set on one pair of trucks, and are made entirely of iron, with a capacity of 6,000 ponnds each. The handling of these cars up and down the incline from the bed of the canyon to the summit of the mountain over track that climhs the side-hill at an angle of 43°, is a sight worth seeing. The Longfellow incline is 2,200 feet long and passes through a 600-foot tunnel en route. A great wire rope that passes around a mammoth wooden drum is the "locomotive." Two cars of 6,000 pounds each of ore are started from the top, their weight hauling one loaded and one empty car from the bottom. Only three rails are used on the incline, the cars meeting and passing half way. The Arizona Copper Company have 6,000 feet of incline connecting their different groups of mines with the railroad to their smelter. The coke and supplies of the Detroit Company are handled hy the Arizona Company over their inclines and railroads.

The Copper Company's Smelter.

The plant of this company as it stands to-day is not only a credit to the huilders, but to the stockholders as well. Few American companies wonld have plodded along for years in the face of a dropping market and made such expenditures in machinery and improvements as these Scotch folks have done. Until recently the plant consisted of three furnaces of the crucible water-jacket pattern. Two of these were built hy Messrs. Rankin, Brayton & Co., of the Pacific Iron Works, San Francisco, and one hy Fraser & Chalmer, of Chicago. Two additional furnaces have heen added, making the combined capacity 300 tons in 24 hours. Water-power is used to run the crushers, hlowers and attachments, two turhine wheels doing the work. The ores, coke and fluxes, after being dropped from cars into ore-hins ahove the smelter, are carried through the various processes by machinery to the doors of the furnaces. From the furnaces a small army of Mexicans are kept busy night and day drawing off slag and copper. The hullion produced hy this company is 98 per cent fine, which speaks well for the furnace manufacturers as well as the efficiency of the superintendent in charge of the smelter.

The "Dandy" Pump.

At Morenci the great tanks that supply the camp with water are noticeable for the eminent position they occupy on the very hrow of the mountain. These tanks are supplied by a four-inch pipe from the San Francisco river, a distance of six miles. A pump worked by a turhine water-wheel forces the water to the elevation of 1,500 feet, and a distance ot over 31,000 feet. The capacity of the pump is 100,000 gallons per day. Henry Worthington, of New York, is the maker of the pump, and it is a fine advertisement of his success in a gigantic undertaking.

Adjoining Copper Claims.

Comparatively speaking, hut little prospecting has heen done by miners outside of the copper companies. What has heen done has resulted in opening up properties that even excel the hest of the company mines in their palmiest days. Along the head-waters of Chase creek, some three miles northwest of the Metcalf gronp of the Arizona Copper Company, are a numher of new discoveries that astonish even the natives; and some of these old-timers are used to seeing some fine copper prospects. Prominent among the new and rich strikes is the Alaska, owned by Messrs. Guthrie, McDermot and Denneu. The opening up of a fine vein of copper glance from the croppings caused a hurried and thorough further development which resulted in the finest showing for a bonanza copper mine that one could wish to see. A shaft down some 50 feet is in solid copper glance that will run about 70 per cent copper and carries also a good showing of silver and some gold. Although hut a prospect as to development, the Alaska is a full-fledged mine as to showing of mineral. Six cuhic feet of this ore makes a ton. The owners are practical gentlemen, "horse sense" miners who know the district thoroughly and work their claim in a husiness-like manner. They are running a tunnel to tap the vein at a good depth. A pack-train of 22 hurros deliver three tons of their ore per day at the Metcalf station of the Copper Company's railroad.

District Crushings.

Water plenty.

Coke costs $30 per ton.

Wood is not used extensively.

The U. S. Hotel is the leading house of Clifton.

The railroad fare from Lordshurg to Clifton is $4.25.

J. H. Vaugh is working the Queen for the Copper Company on a lease.

About two-thirds of the men employed hy the copper companies are Mexicans.

The population of Clifton and the mines of the copper company is about 1,000 in all.

Brown & Cocal are working the El Paso, an excellent copper claim on Chase creek, on a lease.

The circulation of the MINING AND SCIENTIFIC PRESS in this district leads all other papers.

The Arizona Copper Company own the A. & N. M. railroad connecting Clifton with Lordshurg, on the S. P.

Wm. and G. M. Bonnell have a number of mines near the Alaska which they will develop further this season.

Morenci is the name of the town in which the Detroit Copper Company's mines and smelter are located. This company is running one crucihle water-jacket furnace.

Captain N. S. Davis, a California pioneer, is superintendent of mines for the Scotch Company, and he supervised the erection of the railways and inclines of the company.

Wages paid hy the companies are about as follows: Chinamen, $1.50; Mexican lahorers, $2, miners, $2.25; White miners, $2 70. The nationalities ahove are employed in about equal numhers.

Gold in a quartzoze formation has heen found in driving a tunnel in on the Morning Star mine, in Alaska canyon. Mr. Parker, the fortunate owner, is investigating the value and extent of his new find.

The Stevens group, near the Alaska, on Chase creek, has some 700 feet of development done. Some 500 tons that averaged 20 per cent copper have heen shipped from these mines. The group is said to he bonded to capitalists for $100,000.

The Arizona Copper Company have placed a staff of efficient and gentlemanly officers in charge of their property. The following is the roster: Lawrence Russell, general husiness manager; James Colquhonn, superintendent of smelter; Capt. N. S. Davis, superintendent of mines; W. H. Jones, superintendent of railroads; A. B. Ferrie, assistant superintendent of mines. Captains Ed. Murry, M. A. Kelly and Joseph Johndrew have charge of the men of the different groups of mines.

An Eastern company hought a group of 70 claims east of the Alaska, near the head of Chase's creek, some time ago, paying nearly $300,000 for the ground. An agent negotiated the sale and the purchase was made through one man. The entire group has not one hundred feet of development, and if there are a dozen good prospects in the whole group nobody knows which they are. Such "wild-cat" sales are enough to kill any camp in the eyes of Eastern capital. Such a sale could not have heen made to Pacific Coast capital.

F. W. S.

The Meech Process.

The Laramie *Boomerang* says that H. B. Meech, of Cleveland, Ohio, has invented and perfected what is known as the Meech process of treating low-grade ores, experiments hy which have already demonstrated the fact that he is ahle to extract 90 per cent of metal from rehellious ores, such as sulphurets, sulphides, hromides, oxides, tellurides, etc. He came west for the purpose of superintending the erection of two plants of four carloads each of the Meech mining machinery, one in Colorado and one for the Utah Mining Reduction Company, of Salt Lake mining district.

The chief point claimed is that the ores for amalgamation must he decomposed, disintegrated and separated from their chemical combinations before amalgamation can take place, and in order that this may be accomplished the most important factor used is the one which has produced and is producing such marked results in the natural world. Water with super-heated steam, and high temperature with attrition are employed to cleanse the ores to prepare them for the operation of amalgamation. Crushing and fuming the ores will not secure this and they must he cleansed or separated from the associated minerals which cover them and protect them from the action of mercury before it can he brought in contact with them and thus accomplish the object desired.

Mr. Meech looked about as far as he could during his brief stay and expressed himself well pleased with the prospects here. The question of the magnitude and extent of our mineral resources need never enter into any speculation in connection with the future development of the country from the fact that is now assured. All we need is a metbod of treatment which will enahle us to utilize without destructive or disastrous loss the material that is already in our possession. We are situated in the heart of a mining basin that is inexhaustihle, and hence the importance of such a discovery as that of Mr. Meech, successfully demonstrated is heyond measure. Property that has heen worthless will now hecome desirable and profitable, and a new avenue of prosperity is now opened up to thousands of miners who have awaited in poverty and privation for some means of securing the reward for which they have lahored.

Mr. Meech has gone on to Utah and on his return will prohahly stop and investigate still more closely the resources of this great mining center.

THE SALT INDUSTRY IN UTAH.—The salt industry is one that ought to attain some importance in Utah, considering the inexhaustihle supply throughout the Territory. A *Tribune* reporter learned yesterday that operations are heing conducted on a somewhat extensive scale hy Jeremy & Co., at their works twelve miles west of the city. These works consist simply of a large natural pond, covering nearly 900 acres, into which the water from the lake is allowed to flow once a year. It then evaporates and a deposit of salt from 1 to 3 inches in depth is left. This salt is pronounced by Prof. Price, of San Francisco, to he first class in quality, and to compare favorahly with that from Liverpool and elsewhere. From 5,000 to 6,000 tons of salt are shipped yearly from three works. The most of it is of a course quality, for smelting purposes, hut some very fine tahle salt is manufactured. It is estimated that there is now 16,000 tons piled up at the works ready for shipment, and the waters of the pond contain nearly 400,000 tons in solution. An effort was made to induce the Utah and Nevada railroad to huild a hranch to the works, hut when that failed a line of harges was estahlished hetween the works and Lakeside. Capt. Dahl's little steamer is used as a tow-hoat and handles two harges loaded with 30 tons each. A pier 150 feet long has heen huilt at the works, and at Lakeside a Utah Central switch runs out into the lake a distance of 400 feet, and the salt is transferred from the harges into the cars. About 40 men will be employed at the works during the coming summer, and there is no reason why any one should he "too fresh" in this community.

According to the Florence *Enterprise* (Arizona) the Mammoth Mining Company has given notice to all employes that they will hereafter pay only $1 per day to miners and lahorers. This looks like "mammoth cheek." It must he an Eastern company.

The Dawn of Truth.

Every close observer of passing events must he aware that sentiment in California is rapidly hecoming favorable to a revival of mining in all its phases. All along the edges of the Sierra monutains men are concluding, and very justly, that the unreasoning crusade against mining, which began in this State a few years ago, and continued until it has sunk hundreds of thousands in senseless litigation, and destroyed millions of property, was engineered hy a few leaders of pnhlic opinion for the sake of the gain there was in it, in the shape of coin in their pockets. Men now realize that the coin spent in feeing lawyers, hiring newspapers and paying spies, would have leveed the rivers, impounded the dehris, and fostered and perpetuated the great industry of which California has ever hoasted. The truth is rising like the sun in the east, and throwing a light upon the enthusiastic opposition to mining, which has disturhed this State during the past few years, and enahling men to see the utter transparency of that opposition. At least $100,000 of hard earned money has heen paid to lawyers for championing the canse of the anti-hydraulic miners. These anti-hydraulic miners have heen most ingloriously duped. They have followed an opposition to hydraulic mining, that was led hy men inspired with the hope of gain, no matter where it came from. The seleaders of the anti-hydraulic miners have grown wealthy, whi'e those who furnished the money to fight the miners have grown poor, and entailed destruction and pauperism upon the mining communities. Whom have been benefited? The legal gentlemen who furnished the hrains of the opposition to the miners. This truth is gradually forcing itself upon the sturdy, honest farmers of the Sacramento valley, and with a spirit of disgust at their own simplicity, they are heginning to realize that they have contrihuted to their own impoverishment hy destroying the markets for their products, and staying the general wealth and prosperity of the State by aiding and ahetting the unwise and suicidal crusade against the miners. Over $1,000,000 have heen spent in crippling the mining industry of this State. By this unwise warfare $20,000,000 have heen kept from circulation, the farmers have grown no richer, and the navigability of the rivers has not heen improved. It is time to look at this question from a manly, common-sense standpoint, and if we mistake not, the people are gradually assuming that position.—*Oroville Mercury.*

Georgia Gold Mines.

Mr. Henry G. Hanks, State Mineralogist of California, who is at New Orleans with the collection of California minerals, has heen visiting the Georgia gold fields. He promises to to give us the fullest details of the manner of working these mines, their extent, character, etc., on his return to California.

The Dahlonega (Ga.) *Signal* says: Henry G. Hanks, State Mineralogist of California, was at the Union and Fannin county mines and visited the principal mines and mills at this place. He expressed himself as highly pleased with this as a mining country and said that gold mining here is yet in its infancy and that the outlook for the future is good. Mr. Hanks is a practical miner himself and talks intelligently and plainly to us on this great question of mining for gold. Mr. Hanks's visit here will do us much good in dispelling the erroneous ideas that non-residents have of our gold fields in the South.

The New Orleans *Times-Democrat*, in speaking of the visit, says: Henry G. Hanks, F. G. S., F. R. M. S. and State Mineralogist of California, who has heen a very close observer of every display at the Exposition, noticed the mineral exhihit of Georgia and remarked the heauty of the gold ores in that section. To satisfy his curiosity in that direction he took a ruuning trip to the gold fields of Georgia, from whence he returned yesterday. He expresses himself as surprised at what he found there, and is loud in his praises of the mines he saw. He found quartz-mills at work with as many as sixty stamps. Mining as yet is on a small scale there, but it is probahle capital will soon seek this opportunity of investment. The ore is mined at ahout twenty-two and one-half cents per ton, for which $2 is realized. Mr. Hanks speaks well of the possihilities of the Georgia mines.

This is only a single instance of many showing the benefits resultant from the Expositiou, for Mr. Hanks's opinion is regarded everywhere as the very highest in mineralogy.

At a miners' meeting held recently in Manhattan District, Nye county, Nevada, the houndaries of the district were defined as follows: Commencing at the mouth of the canyon ahout five miles east of the Manhattan Pass summit, and about eight miles from the town of Belmont, in the county of Nye, State of Nevada, on the road running from Belmont to Peavine, and following the main wagon road to the mouth of the canyon on the Smoky valley side of the range, thence southerly and following the course of the range to a point opposite and two miles easterly from the San Antonio station, thence easterly to what is known as Ralston Point in Ralston valley, including Baxter's Springs, thence northerly to place of heginning.

The Pioneers' Cache.

The nld miners of the "palmy days" made banks of deposit in oyster-cans buried under the hearths of their cnbins, and in all manner nf out-of-the-way places. In tearing down an old cnbin in Nevada lately, a buckskin purse, stiff and grim with age, bnt full of shining gold, fell from a rafter and becamo the prizs of the purchaser of the promises. The old cabin was occupied by a miner years ago, and long since dead. Above Placerville there is a largs flat which in the early days was very rich in gold, and the old chimneys of ths miners' cabins still dot the flat riks the ruins of a Bashan village. Every hearthstone has been torn up and prospected for deposits, and around ths cabins are prospect holes, sunk by ths latter-day comers in scarch of hidden treasure. Not a few wers successful, [and many nn nld oyster-can has hecn found hidden away lilled with tho precions metal, left by ths early miners who wandered off, expecting to rsturn, or left by those who suddonly died with their boots on.

Above Green valley, on the American river, is a bar which, in early days, was immensely rich. Two miners worked the bar years ago, and suddenly disappeared. Several years after the bar fell into other hands, a shaft was sunk to bedroek nnd large quantities of gold taken out. One day a Mexicau cams upon the grounl and asked permission to prospect ons snd of the bar nsar a large rock. He was granted permission and after wnrking a few days disspeared. He went to Dutch Flat and sold several thousand dollars wortb of gold dnst, whieh, coming to ths knowledge of the owners of the ground, they examined the placo wherc he had wnrked, and discovered that he had found a cnche; probably the gold mined and hid by the early pioneers who had so suddenly disappeared. The mining sections of the State nrs rich with these deposits of the old minsrs who disappearcd leaving no trace behind, and whose bones lie bleaching on mountain top, in canyon and ravine, with no monument to mark their last resting place save the tall pines whicb sing requiems ovsr the graves of these lost ones. Could the early history of California be written in all its details, it would form a volume of romance, startling as it would be interesting, and again demonstrate the fact that trnth is stranger than fiction.—*Oakland Tribune.*

Salt Town.

A New City on the Desert.

The New Liverpool Manufacturing Company at Salt Town, in the Colorado Dssert, has erected a fine steam mill with all ths modern nppliances for reducing the salt from their mines and preparing it for market. Their mill, costing $20,000, is situated two miles from the Southsrn Pacific Railroad, between Walters station and Dos Palms. The mill is situated 3,100 feet from ths road on a spur. The water for the boilers is brougbt 5,000 fest on the top of tbe ground in an iron pipe; and the intense heat, 112 degress in the shade and 132 degrees in the sun, heating the water in the pipe to a temperature of 130, whicb makes it hot enough to inject into the boiler without the aid of artificial heat. The salt is taken from n laks where the salt has a crust over the surfacs of some two or three feet. Holes are cut through the crust ten feet in width and twenty or thirty feet in length, wben a fresb clean crust of nearly pure salt forms in crystals, which ars shoveled up and hauled to tbe mills where it is reduced to a fine crystal salt from 97½ to 99½ per cent. The company also furnish the ice companies, pork packers, creameries and retail trade as far east as El Paso, to the San Joaquin valley, Southern Nevada and the coast counties. The fineness of this salt being from 18 to 20 per cent greater than the imported Liverpool salt makes a market for itself to the exclusion of imported salts. The New Liverpool Manufacturing Company have been so harrassed and annoyed hy tramps that tbcy have imported two blood honnds who keep the tramps away from the works, but do not molest them ns they pass along the road across the desert. These valuable mines that now bid fair to be one of tbe important industries of Southern California are situated in the lowest point in the Colorado Desert, 264 feet below the level of the sea, wbere the average temperature is over 100 degrees in tbe shade, in a territory that at present is otherwise worthless and nnproductive. The development of new and important resources, mineral, agricultural, horticultural and viticultural, in Southern California come on us so rapidly that they almost stagger the credibility of our people, and as a natural consequence open the way to enterprising men to make large fortunes in their first development. —*Los Angeles Herald.*

Tbe Winnemucca *Silver State* reports a new and important strike on the Paradise mines, near Spring City. Bauman & Luther, who own a claim called the Glory, about a mile and a half below Spring City and on the east side of the canyon, have been prospecting it lately. At a depth of 20 feet they have struck a foot of solid ore. The strike is considered of great importance in Spring City, as it proves that rich ore exists in the district a mile and a half from the Paradise Valley, Bullion and Wild Goose mines.

Useful Information.

Transferring Lithograph Pictures to Vehicles.—In doing this work it should be remembered that common colored or uncolored lithngraphs are printed on soft, porous paper, which, when mads damp or wet, stretches, and upon drying shrinks to a great degrec. This peculiarity of the paper must be first attandod to. Lay ths picture face down on a table, dampen the back well with eleau water nnd lay ovsr it several newspapers to keep it from drying. Now, having a white or light colored ground ready, put upon it n thin cont of pale rubbing varnish nnd let it set until nearly dry, that is "tacky," as size would be in laying gold, then lay the dampened picture face down upon the varnish and rub it gently with the fingers until it is well stuck down to every part. Let all dry hard, then with a soft sponge and clean cold water, wet and rub off svery vestige of paper. The picture will be found upon the paint as if printed directly thereon, but of course reversed. A coat of rubbing varnish will prepare it for finishing, or the picture may bo colored if desired. Colored prints may be done in the same manner, but salt should be added to the water to prevent the colors from running. After all is done, a coat of varnish will make a finish.

An oil cloth should never hs scrubbed with a brush; but after being swept, should he cleaned by washing with a soft flannel and lukewarm or cold wntcr. On no account use soap or water that is hot, as either would have a bad effect on the paint. When the oil-cloth is dry rub it wsll with a small portion of n mixture of beeswax softensd with a minute quantity of turpentine, using for this purpose a soft furniture polishing brush. The following is also used to keep oil cloths looking well: Wash them once a month in skim-milk and water, equal quantities of each. Rub them once in thres months with boiled linseed oil. Put on a very little, rub it well in with a rag, and polish with a piece of old silk.

Perfumes of the Orange.—From the orange, *Citrus aurantium* and *C. bigaradia*, are obtained five distinct and valuable perfumes: 1. The true orange flower essence, obtained by digesting the flowers with lard. 2. *Oil neroli petale* or *oil neroli bigarade*, hy distilling the flowers of the sweet and bitter orange respectively. 3. *Oil neroli petit grain*, obtained by distilling the leaves and unripe fruit. 4. *Oil orange of Portugal*, obtained by rolling the fruit in a metal cnp covered with spikes on its inner surface (known as *ecuelle*), which wounds the rind, and causes the essence to flow from the oil glands. 5. Commercial *oil of orange*, obtained by expressing or distilling orange peel.

Paper Slippers.—Paper slippsrs are the latest form in wbich paper is introduced in new inventions. An Englishman has patentsd a system of manufacturing slippers, sandals, and other coverings for the feet ont of paper. Papcr pulp, or papier mache, is employed for the upper, which is moulded to the desired form and size, and a sole is provided made of paper or pasteboard, leather board, or other suitable paper material, which is united to the upper by means of cement, glue, or other adhesive material. The upper is creased, embossed, or perforated at tbe instep and sides, which renders them somewhat pliable, and prevents their cracking while in use.

Driving a Nail.—There is quite a scisnce evsn in so simple a matter as driving a nail. A correspondent in an exchange writes that he recently witnessed the experiment of driving nails into timber that had been hard seasoned and well dried. The first nails, after passing through an ordinary board, went into the timber about an inch, and then doubled up under the hammer. The tips of the rest of the nails were dipped into lard, and the driving was accomplished without any difficulty. The remedy is not a new one, but is simple enough to be recommended for trial.

Water-Proofing Cloth or Leather.—When paraffine is thoroughly mixed with linseed oil, cast into small blocks, and allowed to cool, it may be used to make any fabric as cloth, felt and leather water proof by rubbing it with such a block, and ironing afterward to equalize the distribution of the material in the pores. If too much is not put on, the material may he made to be only impervious to water, but not to air, as the very small greasy pores repei the water hut not tbe air.

Oil from Pine Wood.—A distillery has lately heen put in operation in Charleston, S. C., for manufacturing oil from pine wood. The material is subjected to intense heat in sealed retorts, and one cord of it is said to yield 15 gallons of turpentine, 80 gallons of pine wood oil, 50 husbels of charcoal, 150 gallons of wood vinegar, and a quantity of inflammable gas and vegetable asphaltum. The oil alone is worth about 25c. a gallon, and is used by painters and ship-hnilders.

Improvement in Cut Nails.—An improvement in the manufacture of cut nails has been patented hy Mr. Johu Young, of Wheeling, West Va. This inventiou provides a new form of die for shaping the nail ahout the bead, so its strength will be re-enforced, and thns prevent tbe heads from being so frequently broken off in driving, as has been the case beretofore.

Pickles and Their Packages.—The wood of the pickle kegs may be protected by coating it with parallins. Bottles, however, are the best vessels in which to preserve pickles. A beautiful green color entirsly destitnts of any poisonous qualities may be made by dissolving 5 grains saffron in ½ ounces distilled water, and in another vossol dissolving 4 grains indigo carmino in ½ ounces distilled water. After shaking up each thoroughly, thoy are allowed to stand for 24 hours, and on being mixed together at tho end of that time a fins green solution is obtained, capahls of coloring picklos, etc.

Hardening Tools.—It is said that the engravers and watchmakers of Germany harden their tools in sealing-wax. The tool is heated to whiteness and plunged into the wax, withdrawn after an instant and plungsd in again, the process heing repeated until the steel is too cold to enter the wax. The stocl is said to become, after this process, almost as hard as the diamoud, and when touched with a little oil of tnrpentins the tools are excellent for engraving nnd also for piercing ths hardest metals.

A Glass House.—A Boston man is putting up a building in Chicago, the walls of which will bs of plate glass, and there will he very littlc material in the whole structure except glass, cement and red slate. The building is to be used for offices, and it is reckoned that 75 per cent of the entirc space can be mads available, whereas in ordinary buildings the amount is only from 42 to 54 per cent, so much more being taken up hy walls, halls, etc.

The carriage manufacturing interest of this country, including wagon nud car factories, gives employment to 54,589 persons, and the three or four hundred thousand persons who are dependent on them, and who furnish the raw material. Tbs husiness has extended rapidly over tho United States within the last quartsr of a century. Fifty years ago it was mainly prosecuted in only four Northern States. The numbers of firms, from the bsst information at hand, in the United States is 15,000, and more carriages are manufactured in this couutry than in all Europe.

Hardening Plaster.—The author mixes intimately 6 parts of plaster of good quality with 1 part of fat lime, recently slaked and finely sifted, and uses this mixture like common plaster. He then moistens the object thus formed with a solution of zinc or iron sulphate. —*M. Julhe.*

To Cut India Rubber.—If a knife, or any sdge tool, is moistened with a strong solution of caustic soda or potash, it will cut India rubbsr quite easily.

Solder for Iron, Brass, Etc.—Chloride of zinc dissolved in alcohol will make a good flux for soldering iron, brass or other metal.

Good Health.

The Organ of Form Defective.

Much interest has hceu centered lately in what is called "color-blindness," and inquiry has determined that it is mueh more universal than has been supposed. This inquiry has very naturally led to a more critical inquiry into the condition of others of the human organisms, and now we learn that ths organ of "form" is not unfrequently found quite defective. A late number of the *Christian Union* quotes an artist's experience in relation to persons wbo are lacking in the perception of form as follows: "I have, during many yenrs of art teaching, and in various other ways, encountered a peculiar form of visual defect which is akin to color-blindness. Instead, however, of being insensible to a difference in color, these people appear to have lost, if, indeed, they have ever possessed, the power of perceiving clearly defined forms—form-blindness, in other words. I have sometimes placed objects in the shape of hexagons, or octagons, or decagons, or even so common a shape as a pentagon or a five-pointed star, before these pupils as a test, and almost invariably they were unable to distinguish one form from another, even when with careful distinction the differences were explaiued to them. Then, again, I have tested them by asking one to draw a figure with a certain numher of sides, and the result in this case would be the same. A request to draw a decagon would bring forth a figure whose shape has never been, and never could be named; and if asked to draw a square the result would he a rhomhoid, or some fearful atrocity of augles and lines. It was very amusing. This fact is a curious one, and I do not know whether it has ever been treated scientifically or not. There certainly seems to be a good field for scientific investigations in this strange defect, and I snspect that the trouble would be found to lie very near to that which causes color-blindness, if ever it is investigated."

Mind Cure.—Much attention is just now heing attracted to the subject of "Mind Cure." The *Phrenological Journal*, in reference to the matter, says to an inquiring correspondent: "We do not douht your relation of the effect of the treatment you have received, and it is prohable that if persisted in it will prove altogether curative. Functional diseases will yield to mental impressions far more readily than most people are disposed to believe. Lesions of tissue, like ulcers, cancer, necrosis, consumption, kidney granulation, etc., may test faith in mental cure to the utmost, but there are cases of such diseases that havo been greatly improved and even cured. Every well-informed physiologist knows the wonderful influence of mind upon body, and will not pooh-pooh so extraordinary a statement as that of the disappearance of a scirrhus cancer of long standing under presumably mental influences.

Too Much Sugar.

A mother often complains that her child is troubled greatly with sour stomach, but this cause is no longer mysterious when the mother, to quiet the little one so that she can continue her account of the case, sets down before her a little dish of sugar, from which the child may help itself. Most mothers would give candy or a cookie instead, though some feed their children with lumps of sugar from the bowl, believing that the children need sugar, and better have it in that form than in any other. In any cass of this kind there is a very frequent call for water. Do you know how vinegar is made? You can get plenty of it by mixing sugar or molasses with water and keeping it warm. A sour taste in ths month after eating sweets is of very common occnrrence.

It is the acid caused by the fermentation of the sugar left in the mouth with tne saliva that causes the decay of children's teeth—this and the lack of bone forming material in the daily food. Vinegar "eats" lime, as one can tell hy leaving an egg in vinegar. Bits of sugar or candy left to ferment among the teeth destroy their enamel, as well as do pickles. Ths child that is fed on sweets naturally craves pickles as an antidote, but well-fed children are contented with plain nourishing food if properly prepared and sufficiently varied.

Many imagine that all children should have free access to both sugar and pickles in order to supply what they suppose to be natural cravings, and to prevent thefts of sugar from the family bowl. A mistaken policy.—*American Agriculturist.*

Figs as Food.—The fig, especially in its prepared state, on acconnt of its excessive sweetness, is objectionable for some dyspeptics, especially persons suffering with acid dyspepsia. The first objection can be in a great part removed, however, by steaming. The great number of small seeds which it contains are also objectionable to a certain class of dyspeptics, especially those who have what is known as paiuful dyspepsia—a form of the disease in which there is a considerable degree of tenderness, as shown by pressing upon the pit of the stomach.

Persons suffering with inactivity of the bowels may eat figs daily in moderate quantity, with great benefit in most cases, making the fruit a part of each meal.

Salt in Food.—If we eat the grains, vegetables and fruits and other foods as nature supplies them, says a contemporary, we should have no occasion for salt on our tables, as that substance exists in natural food in the quantity and organized state adapted to our purposes. But the common processes of cooking destroy a good proportion of the saline elements, and hence the craving of the system that is sought to be met hy the inorganic product of chemistry. Ths quantity needed is very small compared with what people get into the habit of taking with their food. One leading objection to the immoderate use of salt is the fact that it impairs the taste for simple foods and delicate flavors.

For Removing Moles.—Dr. Benjamin Godfrey, in "Diseases of the Hair," gives the following: "Local maternal marks or moles can be easily removed by applying the acid nitrate of mercury and letting it remain upon the diseased patch till it dies. My plan is to take a fine pointed glass tube, and, having dipped it into the caustic solution, to dot all around the hirsute mass upon the healthy skin where they both join; then to dot points through the mass, like the white squares upon a chess-board, leaving the blank ones to be treated in a similar manner a fortnight hence. By such a method you prevent too great an inflammatory action setting in and making a less scar in the future.

Electricity and Circulation. — Persons with the mental temperament well indicated possess a higher electrical state than others; their circulation is more rapid, but we do not think that increase of electricity is dependent upon the rapidity of the circulatiou. The charge is derived from without, the peculiar activity and sensitivity of the nervous temperament being conducive to the frictional influences that are productive of electricity. If the charge were dependent upon the circulation of the blood current, then one in a high fever or in that anæmic condition that is usually associated with a quick pulse should exhibit a high electrical excitement.—*Phrenological Journal.*

Lemons for Malaria.—Dr. Crudelli, of Rome, gives the following directions for preparing a remedy for malaria which has proved efficacious when quinine has given no relief. Cut up a lemon, peel and pulp, in thin slices and boil it in a pint and a half of water until it is reduced to half a piut. Straiu through a linen cloth, squeezing the remains of the boiled lemon, and set it aside until cold. The entire liquid is taken fasting.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

CON. AMADOR.—*Ledger*, May 23: At the Con. Amador, of Sutter creek, 12 men are employed in running a drift eastward at the depth of 1,500 feet. This drift has reached 200 feet from the shaft. So far the developments have not been of much importance, but the intentions is to run a considerable distance yet. Vast bodies of quartz have been encountered at various points in the prospecting operations which have been carried on for years past, but all have proved of too low a grade to pay for working. In the eastern portion of the mine, very little prospecting has so far been done, and hence the present drift to determine whether mineral in paying quantities exists in that direction. This company has proved the most indefatigable prospector in the county. The stockholders have been called upon to pay nine assessments of 50 cents each within a few years, without receiving anything in return. Still they stand up gallantly to the work with perseverance that certainly merits success. During this long period of unproductive labor the employes have been paid regularly every month. H. I. Bostwick has some mining ground just south of Jackson, on the line of Zeile ledge, and lying within the limits of what is called the Mother lode. He is unable to work it himself, owing to sickness and lack of means, and is willing to sell it outright, or would give an interest in it to parties who would do a certain amount of work upon it. This is an opportunity worthy of the attention of capitalists and mining men. There are heavy quartz croppings, and the ground proved exceedingly rich in placer gold in early days, and all indications point to the probability of a big mine in that locality. The Mahoney mine was shut down Saturday morning, after a spasm of less than a week's activity. The exact cause of this action we are not able to explain. There is no prospect of its being started again. The pumps have been disconnected, which practically means to let the mine take care of itself. A large and substantial frame building, 20x40 feet, has been built at the mouth of big tunnel at Middle Bar, probably intended for a boarding-house. An office for the company is also being built near Mr. Nevill's residence. The Huntington roller quartz-mill at Murphy's gulch has been started on the dump pile of the Morgan & Shugert claim, with a long run ahead in the event of the result proving satisfactory. The course of the big tunnel at Middle Bar has been inclined slightly to the west, toward the slate, evidently with the view of prospecting for ledge matter.

VOLCANO.—The Volcano Gold Gravel Mining Company is cleaning up at present. Several thousand dollars have already been sent below. Mr. Ross had about 75 tons of rock crushed at the Downs mill, which paid about $35 per ton. There are indications of the Tellurium mine, located at Pine Grove, starting up soon.

Mariposa.

GERTRUDE.—There is considerable activity in mining circles. The Enterprise people continue to abstract ore and the mill will start up next week, when it is expected to run for some time. The Lucky Bill mine has closed down for the present. The owners took out considerable ore the past winter which they had worked at the Enterprise mill, and which paid a handsome profit. The Fresno mine, owned by Messrs. Dolan & Graham, is being worked by them with magnificent results. The ledge is small, but very rich. From 4 tons of ore recently reduced at the Enterprise mill over $900 was realized. One of the most important discoveries ever made in this district was made about a month ago by John Hale and Charles Tucker, on the east slope of Crook's mountain near Metcalf's gap. This ledge is six feet wide and it all carries gold, with a large percentage of gold-bearing sulphurets, of which samples have been sent to San Francisco to be assayed. The ledge lies between granite and slate with a fine gouge on the foot-wall. The owners are engaged in sinking a shaft which is now down 35 feet, and they say the rock improves as they go down. Messrs. Baker and Crain are prospecting Miani mountain for a quartz ledge where they have found some very rich float that assays up in the hundreds. Messrs. Collins and Christianson have been doing considerable work the past winter and spring on French gulch, and have opened up several fine lodes. From the present outlook it is only a matter of time when that section will be a booming mining camp. At Grub gulch mining is quite active. The Gambetta mine and mill are running full-handed, also the McDonald mine and mill. The Lafayette mill has been running on King gulch rock for some time, with good prospects. That mine will probably commence operations shortly. Messrs. Betts and Oxindine are sinking a shaft on the old Ned mine, situated on King's gulch, where they hope to strike it rich soon. Their prospect is spoken of very highly.

Nevada.

STRUCK THE LEDGE.—Grass Valley *Union*, May 23: The downright shaft which has been in progress of sinking for some months on the Grass Valley Company's location (the Bobby Smith ground) which adjoins the Ford & Mullen claim, reached the depth of 188 feet on Wednesday night, at which point a ledge of good appearance was struck. None of the ledge had been taken up yesterday, and its size was not definitely shown. This ledge is in a good locality, and it may be reasonably expected that it will turn out paying ore when it is opened upon.

RICH ROCK.—San Juan *Times*, May 23: Immensely rich rock has been discovered recently in the 300-foot level of the Delhi quartz mine. The vein is of an average width of 11 feet, and none of the rock taken therefrom is discarded as worthless. It is all put through the mill. The Delhi mine is, in our opinion, the best quartz mine in the State. Specimens have been taken from that mine in which quartz is the exception.

LONE TREE MINE.—Foothill *Tidings*, May 23: The Lone Tree mine, near Allison ranch, has been purchased by some San Jose parties, John Sevenoaks being their agent. We could not learn the purchase price of the mine. Work of clearing out the tunnel and general repairing has already been commenced, and is under the supervision of John Townsend. When the Lone Tree was working much of the quartz showed gold, and gave encouragement for further developing the mine. It is the intention of Mr. Sevenoaks to push work ahead as rapidly as possible, and they will soon find out what is in the mine.

CALEDONIA QUARTZ MINE. — Nevada *Herald*, May 26: Work at the Caledonia quartz mine, Canada Hill district, is at present going on satisfactorily. The large volume of water encountered some time since, has been run off through the drain tunnel, and now the owners are engaged in sinking on the lead. About a ton and a half ore is being taken out per day by two men on a shift, and when a sufficient quantity has been taken out to obtain a fair test, a crushing will be had. In the shaft a big lead will, no doubt, soon be struck. The rock already taken out is heavily charged with sulphurets, and doubtless will give a good return. The owners feel somewhat pleased to think that they have got the heavy body of water, which has been a great drawback, out of the mine.

Placer.

IOWA HILL MINING NOTES.—Placer *Argus*, May 21: The mines are doing well and look first-rate for large yields of gold in the near future. The Golden River Co. are going to great expense in refitting their mine. They have upward of fifty men employed at all kinds of work. The company are putting up new buildings for hotel accommodations, cottages for families, etc. The mine is reported to be looking splendid, and the new company are pleased with their purchase and are desirous of securing more ground in the vicinity. The company are putting up a telephone line from the mine to Iowa Hill. The Watts Bros.' mine is reported to be yielding satisfactorily to the owners. They employ some five or six men. The Colden Gate mine continues its reputation as the boss nugget-producing mine of the district. We were shown a nugget by A. D. Bowley, taken from the mine last Saturday, that weighed over a pound; besides this big one, he exhibited several smaller ones taken from the mine the same day. The Morning Star mine employs some ten or twelve men. The mine is reported to be looking splendid, and the owners appear to be entirely satisfied with the present returns. Other mines in the district are reported to be doing well. When the tunnels are driven back into the main ridge, into the main tunnels, this is destined to be the richest mining camp in the State.

THE OLD THIRTY-ONE.—Placer *Herald*, May 23: The old Thirty-one quartz mine, located on the Auburn and Sheridan road, a short distance this side of Dane Town, and formerly worked by J. C. Crosby, has been taken hold of by a San Francisco company, who after three weeks constant pumping have got the water out, and are preparing to put up new hoisting and pumping machinery, and work the mine systematically. When Mr. Crosby operated the mine he worked under certain disadvantages which this company will overcome, and knowing from the past what is in the rock they are confident of making it pay.

Sierra.

THE YOUNG AMERICA MINE.—*Sierra Tribune*: From parties who have recently visited the Young America we learn that the mine is looking remarkably well. The road leading from the Sierra valley thoroughfare to the mill will be finished in a short time. Grading for the mill site has commenced, and the strong, heavy wood-work for the same is being framed at Haggerty's saw-mill. The owners fully expect to have everything in perfect order and the mill running by the Fourth of July. One of Hallade's wire-rope tramways is to be erected to convey the ore from the mouth of the tunnel to the mill. The length of this tramway will be 2,500 feet. The future outlook of the Young America mine is very flattering. Under the judicious management of A. C. Busch everything pertaining to the successful working of the mine will be carried on in a satisfactory manner.

MILL.—*Mt. Messenger*, May 23: Mr. Sutherland went below some two weeks ago for the purpose of procuring a Huntington quartz-mill for his quartz claim at Poker Flat. This location extends 1,500 ft. on each side of Canyon creek and the rock prospects well on both sides. The tunnel now being run at Deadwood, by Mr. Rouse, is for the purpose of working the New Orleans ground, which was too low for any of the tunnels heretofore driven through the property. We understand that the company give one-half the claim for the running of the tunnel 1,200 ft. The Slug canyon mill was started again Tuesday and will be run as long as water holds out. Since the stoppage the lower level tunnel has been driven ahead some distance to the ledge and no difficulty had in keeping the eight stamps going. J. E. Carney is in charge of the amalgamating department for a time.

Siskiyou.

ORO FINO.—Cor. Yreka *Union*, May 21: The miners of this camp have about wound up for the season, the water being almost exhausted, and the farmers coming in for their share. This has been the lightest water season known for many years, there only being water enough here for one claim to run at a time all the season. Messrs. Campbell & Co., of Quartz valley, are still running with a good head of water, and the prospect for a good clean-up is flattering, although they haven't got off so much ground as usual, owing to the lack of pressure. As they work higher up the gulch the pressure gets lighter. Mr. A. M. Johnson has put up a new boarding-house at the mine on the Oro Fino mountain, and has put on a full set of hands, and we may soon expect to hear the rattle of the ro-stamp mill reducing the ore. George Tompking struck a pocket in his quartz claim the first of the month, from which he pounded out $400 in one day, and there is supposed to be $1,000 still in the pocket. Some capitalists have bought two ledges in this camp, one known as the Peter Stevens or Italian Pete ledge, consideration, $2,500; and the Thomas Macaulay ledge. On the latter ledge I failed to get the figures sold for.

Shasta.

PLACER GOLD.—Shasta Co. *Democrat*, May 20: Gus Tyler last week sold his placer claim, situated near Copper City, to Lute Bahney. A. C. Ellis, of Windy Camp, was in town yesterday and reports much activity among the miners on Squaw creek. Considerable prospecting is going on, and good property is being discovered. Camden, McGee & Co. have started up operations on the Lost Confidence again, and will commence shipping ore to Denver this week. They have commenced a new tunnel which will tap a large ore body one hundred feet deeper than the upper tunnel. Mr. Stickley informs us that a Red Bluff company has given Ed Hume a contract to run a tunnel at a point about 4 miles north of Mabel postoffice on the Sacramento. The tunnel is calculated to drain about three miles of the Sacramento river, the bed of which is said to be rich in gold.

Tuolumne

NEW HOUSE.—Tuolumne *Independent*, May 23: A new house has recently been erected over the pumping machinery of the Gold Mount Water Co. It is a substantial improvement, and, if well covered with paint, would last many years longer than it will without. Another rich strike has been made in the Soulsby mine, which is said to be better than any heretofore found. Free gold all through the ore and enough rock in sight to last two years.

Trinity.

BIG CLEAN-UP.—*Journal*, May 23: Messrs. Van Matre & Ramm, of the Monte Cristo mine at Deadwood, recently had 62 tons of ore crushed at the Brown Bear mill, from which they realized something more than $6,000, or at the rate of $100 per ton, to say nothing of a large body of very rich sulphurets remaining to be reduced. The gentlemen named are running the Monte Cristo on a lease from the Brown Bear Company and the result shows the mine to be a largely paying one for all parties interested. We learn further that there is at present an immense body of equally rich ore in sight.

FROM NEW RIVER.—Several gentlemen arrived in town this week from New River district, being interested as parties and witnesses in the case of Clifford vs. Ladd & Clements, which comes on for trial in the Superior Court on Monday next. From them we learn that the district is flourishing and is settling down to a lively and prosperous camp. The older mines are working steadily and profitably, while later discoveries are being proven and preparations making for working them according to their prospects. While no great rush has been made to that locality, the prospects are excellent and the district is certain to grow with a steady and healthy growth. M. C. W. White brought in some rock from a recent discovery of Fowler & Co., known as the Mountaineer mine, which prospects well.

DEADWOOD.—Our camp never saw better times than she is enjoying at present. Thomas Simons, superintendent of the Klein mines, is pushing things ahead in a workmanlike manner. About 12 men are now employed and splendid ore is being extracted. Wm. T. St. Auburn is creating lively times on Thorn gulch. A wagon road is nearly finished to the mine and lumber will soon be upon the ground to build a large boarding-house for the accommodation of his employes. Operations are being forwarded at the mine, and latest accounts report everything favorable. Mr. St. Auburn has also purchased the adjoining location in which Frank Mabie and Will Clements, two speculative young men, were part owners. Gibson & Blagrave will soon tap their ledge with the lower tunnel, as very favorable indications are putting in an appearance. Ramm & Van Matre, of the Monte Cristo, are having their ore crushed at the Brown Bear mill. The ore in the mine looks rich, with plenty in sight. The Vermont mine, owned by Mrs. H. Willey, is in splendid condition owing to the skillful work of that "boss miner," Joe Falan. Hurlburt & Bearden, on Eastman gulch, bring down their wages every week in specimens and gold which show up well for their mine. Curt. Blakemore will soon commence operations on his mine and we only hope that its future will be as prosperous as its past.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, May 23: Since last week's regular mining summary the water has been completely subdued, depressed and extracted from the two lower levels, and the big hydraulic pump at the Combination shaft is holding it in complete subjection, without half trying, or, at any rate, without being worked up to its full capacity. The 2,900 and 3,000 levels are being cleaned out and repaired from the effects of the hot water deluging they have been submerged with. Timbers and lagging were found displaced, and debris run in from all sides, but both levels will be placed in just as good condition as before the flood, by Monday next. On the 3,000 level, the main lateral drift north has been cleaned out and repaired as far as cross-cut No. 2, and work has been resumed in cross-cut No. 1, west. This cross-cut is 90 feet north of the Chollar south line, and has been advanced about 50 feet west from the main north lateral drift. Cross-cut No. 2 is about 150 feet further north, and in the north lateral drift from this, it will be remembered, was the last work being done in the ore vein when the flood stopped operations. On the 2,900 level, further ore development work is postponed for the present, on account of bad air and heat, until a new drift or gangway, just started, can be run from the incline winze on the 2,400 level to connect with the Savage incline. The distance is about 160 feet, and the connection will probably be made in three or four weeks. This connection is very important and essential. Meanwhile, the 3,000 level will be all the better supplied with air, and, being much cooler, work can be concentrated at that point to good advantage and with excellent prospects of bonanza success. The proposed air connection will also be of important assistance in deeper explorations, if desired, below the 3,000 level.

BALTIMORE CON.—The new roasting furnace will be completed about next Tuesday ready for firing up, and next in order will be the hoisting of the ore stored in the drifts on the 450 level, which has been accumulated by the tributers working at and below that point. This will only be hoisted as required for milling and roasting. It is all rich ore, $100 per ton and upward, and will be dry crushed in the five-stamp mill near the works, and roasted in the furnace with the proper proportion of salt to chloridize it. This ore has to be thus worked by the dry chlorination process by reason of a large proportion of it being ruby or antimonial silver ore. The vein is from about three to a dozen inches in width, and they have followed it with a winze 70 feet below the 450 level, drifting laterally and stoping it out at that depth. They propose opening it from the 600 or 700 level also, through the main shaft. The parties working on the 225 level are still sinking a winze following the vein, which shows very well.

CON. CALIFORNIA AND VIRGINIA.—On the 1,750 the south drift has been run through to connection with the 1,700 Gould and Curry drift, and a cut is being driven across the old burned-out stopes to cool the ground. Five hundred and thirty-eight tons of ore were extracted from this level last week, worth $16 per ton. From the old stopes between the 1,550 and 1,200 levels, under the Jones lease, 1,040 tons of ore were extracted last week, the average assay value being $15.63 per ton. The ore stopes are holding out well, and show no signs of exhaustion. The machinery of the Con. Virginia shaft is being put in order, and preparations made for repairing the shaft.

BULLION.—The parties engaged in prospecting the croppings are getting along very well with the work. Their whim at the old Fairview shaft operates finely and does all the required hoisting.

CHOLLAR.—Owing to the work of cleaning up and repairing the 3,000 level resultant upon the flood no ore development work has been done.

BEST AND BELCHER.—The north lateral drift on the 1,000 level is being repaired and advanced, and common report locates a big bonanza as being long known and about to be developed in the 1,200 and 1,300 level regions of this mine. But common report lies like blazes sometimes.

YELLOW JACKET.—The munificent yield of fair grade ore from the old upper workings still continues, with no particular change to note. The stopes about the 400 level, or "frog pond," are represented as looking and yielding particularly well.

OPHIR.—The upraise from the 500 level, to connect with and drain the old Mexican shaft, is making good progress. A west cross-cut from the main north lateral drift has been started in connection with the Mexican Company on this level.

MEXICAN.—A west cross-cut has been started on the 500 level, conjointly with the Ophir Company, and is making good progress. The joint Union and Mexican drift on this same level is going ahead well in good working ground.

GOULD AND CURRY.—From the main lateral drift south on the 1,000 level a cross-cut east has been started near the Savage north line. It is also proposed to cross-cut west and intersect a promising ore vein found in the level above.

ALTA.—The prospecting stopes above the 950 level still continue yielding a small amount of fair grade ore in spots and bunches, which are being saved for reduction.

OVERMAN.—Some pretty fair bunches of ore are being found in the low-grade reserves being raided into on the 226 level. About a dozen tons a day are being extracted.

KENTUCK.—The daily yield of low-grade ore has fallen off a little, so that only half the stamps of the Rock Point mill on Carson river are kept employed.

SIERRA NEVADA.—The north lateral drift on the 520 level is making steady progress northward in good working ground.

WOODVILLE.—Tributers have resumed work on the 400 level of this mine during the past week.

Columbus District.

MOUNT DIABLO.—Candelaria *True Fissure*, May 23: The west drift, on the sixth level, has advanced 74 feet during the week, and the winze to meet this drift is down 113 feet. The west drift on the third level is looking well. The intermediate stope, between the second and third levels and west of the shaft is giving the usual amount of ore. A bullion shipment of $13,215.45 was made on the 15th inst.

Eureka District.

LOOKS DECIDEDLY BETTER.—*Sentinel*, May 23: The Eureka Con's new reduction works were started up yesterday, and from the first everything worked satisfactorily and smoothly. With two of the Richmond furnaces at the upper end of town in full blast, and the Eureka Con's at the lower end of the town in like active operation, the business air of the community again assumes tangible form. Both works are well supplied with ore, and the probabilities are there will be no cessation of such work for many months to come. The Richmond company have in their mine a good sized body of ore which they will doubtless begin to extract before many days, or just as soon as they require any at their works, while the Eureka Con. property is looking better than it has at any time in the past two years. Considerable dead work has just been completed in the mine between the sixth and seventh levels close to the Williams pitch, in order to get air, and at the same time to better facilitate the working of the body of ore, which has now the appearance of being considerably larger than it was a month ago believed to be. Other pitches in the mine are also said to look well. Altogether, while our people are not, from even the present outlook, justified in expecting a boom this summer, yet they can feel assured that the town will not get any duller than it now is.

PROGRESS.—Eureka *Sentinel*, May 21: During the past week mining has looked up some little throughout Eureka district. Work has been resumed in several old claims in which operations were suspended some time ago. Hon. Thomas Wren is again working his Mt. Hope properties, and several tributers are now at work there with a most excellent prospect of doing better than if they were working for day's wages. H. W. Hhising, of Cincinnati, who owns some excellent properties on Prospect mountain, has put a force of men at work in the Silver State, and although they have been working but a few days, the prospects already shown are said to be flattering. What was believed to be an average sample was taken from a streak of ore which was followed from the surface down several feet, and an assay of the same was made, which went over $500 a ton. While it may in itself not amount to a great deal, it evidently is a feeder to something larger and of greater value at a lower depth. The smaller mines of the district continue their shipments without any tendency toward a falling off in the amounts. We were unable yesterday to obtain anything like a full list of the producing properties, and the amounts of ore shipped to the two furnaces here the past week, but from what intelligence of the character we did get we feel justified in believing the yields are gradually increasing. The Hamburg mine, in New York canyon, shipped to the Eureka Con. 12¾ tons, the Bowman mine, on Adams Hill, sent to the same works 10¾ tons, and

from the Lord Byron, on Prospect mountain, was shipped to the Richmond furnaces some 30 tons. In the last-named property, on the tunnel level and near the old shaft an engine has been set, which works first-rate and fully up to the expectations of Supt. Kermeen, but before it can be utilized to hoist ore from the lower levels some work is necessary to be done in the lower part of the shaft, which, it is hoped, will be accomplished during the coming week. The shipments from the property will then probably increase, as most of the ore being sent in from it comes, we believe, from below the tunnel level. The Silver Lick mine, on Adams Hill, sent in 25½ tons to the Eureka Con. works; the Summit, on Prospect mountain, which adjoins the Banner, shipped 10¼ tons and the Fraser & Molino, 4¾ tons. The Morning Star, an extension of the Macon, on Adams Hill, shipped to the Eureka Con. works 9¾ tons, and the Hoosac, on Prospect mountain, made a shipment to the Richmond works. The Lone Pine, another Adams Hill property, sent to the Eureka Con. works something over four tons, and to the same works was shipped from the Eureka Tunnel, on Prospect mountain, 3¼ tons. The old Continental mine, near Hamilton, made a shipment of ore to the Richmond works, and the property is said to be looking quite promising and evidently fruitful of further shipments. There is nothing particularly new to report of the Eureka Con. or Richmond mines. Both of the properties are looking and yielding well.

Tuscarora District.

NAVAJO.—*Times-Review*, May 23: Fair progress has been made with the work at all points on the 650-foot level. The upraise has been carried up 25 feet the past week. The usual progress has been made with the work elsewhere in the mine.

GRAND PRIZE.—The machinery at the hoisting works has been thoroughly repaired and is now in good running order. The timbers in the shaft immediately above and below the 200-foot level have been eased and the shaft straightened. The 200-foot level has been timbered and they have commenced hoisting ore from it and putting it in the mill. Repairs in the mill will be completed about the first of June, when the milling of ore will be resumed.

Taylor District.

LIVELY.—Cor. Eureka *Sentinel*, May 23: The mines of the district continue to look splendid, especially the Monitor and Argus, both of which turn out the usual amount of high-grade ores. Our two mills are hammering away, and as you know our bullion shipments are large and regular. The business men of the town are kept busy, and are making improvements on their respective places of business.

Wild Rose District

PARADISE MINES.—*Silver State*, May 2: Frank Gregor, down from Paradise mines, reports everything quiet at Spring City. Work is being prosecuted on the Paradise Valley, Wild Goose, Bullion of Paradise and Glory mines, and all are looking well. The Glory, which is located a mile and a half from Spring City, is developing into a very promising mine. The lead now ranges from 1 to 2 feet in thickness, and the ore is very rich. Should this lead continue to yield as rich ore as it now does, and there is no known reason why it should not, it will encourage prospecting in the vicinity, which may result in the development of new mines equal in richness and extent to those now being worked on the west side of the canyon, in the immediate vicinage of Spring City. Near the Glory is a claim known as the Rattler, owned by miners who have no capital but pluck and muscle. They work at whatever they can get to do a part of the year to earn money to purchase provisions and tools to enable them to develop their mine another portion of the year. They have faith in their claim, because they are practical miners and know that it has the characteristics of other mines in the district, which have proved valuable. Former owners found a body of very rich ore in it, and experience has shown in the Bullion of Paradise, Paradise Valley and Wild Goose, that where rich ore is found in small quantities near the surface, more extensive and richer ore bodies abound at a greater depth.

Washington District.

TUNNEL.—Belmont *Courier*, May 21: Uncle Billy Koch is hard at work running the tunnel in his mine at San Juan, Washington district. He has cut through two ledges that carry ore of a low grade. He expects to tap the main ledge in a few weeks, with the hope that the ore will prove of a better quality. In the early days of Nye county considerable work was done in Washington district, but the ore proving of a rebellious character the mines were abandoned, and until a few years back have attracted no attention. There is one patented mine in this district—the St. Helena—that show a big ledge of this rebellious ore. Experts think that with the improved reduction facilities of the present time, the ores of this district ought to be profitably worked.

ARIZONA.

GENERAL NOTES.—Clifton *Clarion*, May 20: The hoisting machinery and engine will be in place this week at the Detroit. A great deal of lagging has been brought to the Longfellow recently from the vicinity of the Coronado mine. The Alaska continues to look well. On the second level last Saturday they struck a fine body of 30 per cent ore. The copper ore in the Morning Star is a high-grade black oxide. Parker & Whalen are getting out the same to sell to the Arizona Copper Company. Numerous ore platforms are being constructed on the line of the Coronado railway, on which ore will be deposited by pack trains from the King and other mines. The claim "7.30," recently opened near the Queen, that native copper was struck in last week, continues to produce the same. It belongs to the Arizona Copper Company, and was opened in the bed of Chase creek. Brown & Cole, the lessees who are working the El Paso, in the face of the 100-foot tunnel, have struck the body of ore which was uncovered on the surface 80 feet above. The ore is black oxide, carrying a strong trace of gold. Mathison & Morris have completed their contract of building a wagon road to the White Hawk mine from the Metcalf, three-quarters of a mile in length, and are now hauling ore to the head of the incline. They have a contract to deliver 2,500 tons. The White Hawk belongs to the Arizona Copper Company. The ore is quarried, not mined, and is of an exceedingly good grade. Mr. Wm. Bonnell has struck gold-bearing rock of the same quality as that found in the Morning Star on a claim recently located by him in the same vicinity, and distant from it 3,000 feet. What work he has done to date has developed a vein of free milling gold ore the width of the shaft.

SOUTHERN PIMA.—*Beef and Bullion*, May 20: At Arivaca, Messrs. Untbank and Whitmore have the road to their mine finished. Their mill will start about the 15th inst., to work custom ore. Good ore is now being hauled to the mill. The Con. Arizona mine and mill closed down a few days ago, leaving only a man to pump water from the mine, which is down 240 feet. Mr. Joyce, the superintendent, who was sent from the east to inspect and straighten matters out, has gone to New York, having paid out $25,000, and put everything in order. He will soon return, when another 100 feet will be sunk on the mine. The company has been reorganized, and is now known as the "Mutual Arizona." They have plenty of ore in the mine that will average $80. The mill has five stamps.

COKE.—*Silver Belt*, May 23: Dr. Alex Trippel, superintendent of the Old Dominico Copper Co., received a telegram on Monday conveying the pleasing news that shipments of coke would begin on that day. Further information is expected by letter. The shipment of coke at this time is assurance of an early resumption at the mine and smelter. J. C. Jones is still driving the tunnel in the Cross-cut mine and is now in about 100 feet with favorable prospects for a good permanent mine. The ledge shows up the full width of the tunnel and all ore. This mine is conveniently situated, being only about 3 miles from the Miami mill, with a good wagon-road right to its mouth. E. F. Kellner & Co. have contracted with J. M. House for the hauling and milling of a large quantity of silver ore from the Rouse & House mine in Tonto Basin. This arrangement will doubtless give other miners in that vicinity an opportunity of sending ore to Globe for reduction, which it is hoped they will embrace.

COLORADO.

ELK MOUNTAIN.—*Pilot*, May 21: Work has been resumed on the Forest Queen mine with a full force. The death of Prof. Ridgley caused the cessation of work for a few days. We understand that they have about five carloads of ore ready to ship just as soon as the road will permit hauling. A. W. Anderson is home from Aspen, and will work his property on Brush Creek. Henry V. Meloy, the superintendent of the Richmond mine, was the first superintendent to venture into Poverty gulch and Dark canyon this season. He made a trip to the Richmond mine last week, withstanding the perils and hardships incident to a trip in that locality at this time of the year.

CRYSTAL CITY.—The deep snow keeps prospectors from going into the carbonate belt and the district between here and Aspen. Work is being steadily pushed on mining property around Rock Creek hot springs. Squire Beardsley was down from the Detroit, and reports the mine looking well. He has struck a good body of galena ore. Jim Sprague is assisting him and they are pushing work. The Sunshine property is showing way up. It is one of the best properties this side of Sheep mountain, carrying copper and galena. The Grand Republic vein will be cut in about 25 feet, when we may expect to hear of a good strike of gray copper ore. Bob Cory's property is being put in shape to be developed by a tunnel, and shows a vein 15 feet wide. When he gets this vein opened up it will be one of the best on Rock creek.

IDAHO.

MINERAL MITES.—Houston *Press*: The boys working on the Alice say the hill in which the mine is located is simply a mass of mineral. The Sullivan mine is in good ore, and the chance for striking the main ledge is good. The Ada prospect is coming to the front and bids fair to soon be entitled to be called a mine. The Superior will begin taking out ore in a few days. The Louisa property is being prospected. The Isabelle will be worked for ore as soon as the smelter starts

SOME OF THE PRINCIPAL GULCHES.—Wood River *Times*, May 23: The active season being about open it behooves us to look into the prospective yield of the mines, upon which our prosperity depends. In Resurrection district, 15 miles south of Hailey, mines are opened which will probably compel the erection of a mill this season. Hon. John Hailey, the principal owner of those mines, will be here in a few days, and if he concludes to have a mill at least 50 men will be employed there this summer. Along the range forming the eastern boundary of the valley to Bellevue—on the Queen Victoria, Deadshot, Monday and other ore-producing claims—probably 25 men will get steady employment. At the Minnie Moore, Queen of the Hills and other Broadford mines probably 150 men will be steadily employed. In Colorado gulch and adjoining localities 25 men will be employed. On the opposite side of the valley and up Quigley and Indian gulches at least as many more. Up Croy gulch to the head of Rock and Camp creeks the possibilities are great. There are the Chief of the Hill, Japan, Belleisle, Climax, Fearnaught, Black Prince, Ornament, Ohio North, Ohio South, Bismarck, Oriental, Montezuma, Guy, Camas Nos. 1 and 2, and a large number of other claims which have already yielded considerable quantities of ore, and which will greatly improve on former shipments. If the mill now building for Camas No. 2 treats the ore successfully it is possible that 500 men may find employment on the gold belt alone within the next 3 months. If the mill does not make a success the smelting ore claims will employ about 50 men all told. Kelley gulch will continue to yield small quantities of good ore. So will the Idaho Democrat, above the Warm Springs. At and near Bullion things look decidedly favorable. The Idahoan company is going to have "the bottom knocked out" of their mine this year, and all of 100 men will be required to do it and they will probably only succeed in uncovering more ore than is in sight now. At Bullion, the Bullion-Ophir and Mayflower deep tunnels are just getting into the vicinity where they expect to strike ore. No mining man doubts that ore will be found there in larger quantities than ever. At all events, even if no new body is found there is plenty of ore in the upper levels that must be extracted and shipped. The O K, Point Lookout, Valley View, Mountain View, Bay State and other claims will all resume their shipments soon and continue all summer. The Eureka is said to be a better mine than the Bullion ever was. The same is true of the Ophir. Bullion and vicinity may therefore be reckoned on to give employment to between 250 and 300 men. Deer Creek will assuredly come to the front. The Montana and Snowfly claims of the St. Louis and Idaho company are showing up immensely; the Bullwhacker, Wolftone and other well-known claims will remain in the ranks of ore-producers; the Davitt will do likewise, while the Narrow Gauges, Bannack, Robert Emmet, French Boys' Group and others will ship large quantities. The Cyclons, back of the Narrow Gauges, will undoubtedly make heavy shipments all summer. Up Greenhorn gulch, Milton Pinney's claims will do even better than last year. On the East fork the North Star concentrator will work all summer, while the Triumph group will doubtless pay good dividends. Other claims on the fork will also ship ore to market. In Elkhorn gulch the Elkhorn, Parker, Quaker City and other claims will ship steadily all summer, while other Trail creek claims will probably follow suit. Up Warm Springs creek there are four smelting furnaces, two concentrating works and a large number of claims whose aggregate yield this year will not fall short of $1,000,000. Boulder creek, the home of Judge Beatty's ophir and other high-grade claims, will probably turn out no inconsiderable quantity of ore. At and around Galena at least 75 men will be steadily employed. At and near Vienna 150 men should find employment, and the output this year approximate $1,000,000. At and near Sawtooth the yield should reach $250,000. The Smoky districts will doubtless ship $300,000 worth of ore this summer if the wagon-road can be completed in time. Enormous dumps are awaiting transportation to market. The above is a very moderate estimate of the probabilities of this region in the mining line this summer and fall; but it will suffice to demonstrate that the outlook is really more favorable than at any time before since the first settlement of this region by the whites.

MONTANA.

STRIKES.—*Inter Mountain*, May 23: The principal events that have marked the progress of mining in this district during the past week are important strikes in the Elm Orlu and Springfield, and on the north vein of the Valdemir, and the completion of the Alice shaft, to the 800-foot station. The Elm Orlu strike, though as yet but a surface showing, is netting its owners $600 daily clear of all expenses. The development of the Springfield is not yet thorough enough to determine the exact size and richness of the strike, but the ore, as far as explored, is of very high-grade, and is solid and clean, over a foot of it assaying upwards of $500 per ton. The importance of the strike on this property is destined to have an excellent effect on contiguous mines, and stimulate hope in their future.

THE LITTLE ROCKIES.—Scarcity of water is preventing effective work in the Little Rockies this spring. At the head of the Little Horn parties are engaged in building a reservoir, which, it is thought, will furnish water enough for sluicing about four hours per day. On People's creek gold is being taken out at the rate of $2.50 to $3.50 per day to the man. Work has been suspended on the deep diggings for the present, but will be resumed later in the season. On Rock creek there is a scarcity of water, but in Little Alder money is being taken out constantly, $1,700 having been shipped from there recently.

IN THE SWEET GRASS HILLS.—The *River Press* says that paying mines have been found in the Sweet Grass hills, and are now being worked. They were discovered last fall by four men, who have kept it secret until now. The discoverers say that the diggings will yield from $5 to $7 per day to the man. The new find lies near the British line, about 80 miles from Benton.

MISCELLANEOUS NOTES. — The new Gregory shaft has reached a depth of 135 feet. The Drum Lummon managers estimate an output of $100,000 as the total for May. Last week the Northern Pacific Express Company and the freight department of the road shipped $150,000 worth of bullion from Helena. On Tuesday Charley Colter took to Helena 40 pounds of gold retort, the result of a 15-days run on ore from the Bluebird-and-Hickey mine, 15 miles from Helena. The districts of Pony, Red Bluff and Richmond, Madison county, are coming to the front. Twelve tons of ore from the Grub Stake mine, sent to Omaha for reduction, yielded $2,420.26 net. It is reported that a marvelously rich strike was made last week in the 500-foot level of the Elkhorn, and A. M. Holter says there is not enough money in Montana to buy the mine now. On the Parker and Griff mines (situated on the same lead as the Bald Butte, 15 miles west of Helena), five 100-foot shafts have been sunk, showing a narrow streak of very rich ore, which assays from $5,000 to $9,000 per ton, and a 4-foot body of $40 ore.

NEW MEXICO.

THE PROGRESS OF THE SMELTER.—Rio Grande *Republican*, May 23: The smelter site presents a scene of life and animation. Over fifty men—mechanics, builders and laborers—are rapidly getting everything in order to begin the reduction of ores. The walls of the offices and laboratory are raised and ready for the roof, and those of the main building and engine-room will be completed this week; brick layers are at work on the chimney which will be 80 feet in hight; the engine and machinery are all in place, and both the galena and copper stacks will be raised next week. Ties for the side track are being unloaded, and this will be laid immediately. The ore bins are being filled with ore from the Jay Gould, Bennett and other mines of Organ, and within a space of time that has narrowed down to a few weeks the plant will be producing bullion.

ORE. — Silver City *Enterprise*, May 22: A car shipment of ore from the Old Man was taken to Deming on Monday by Chas. Seldomridge, son of the president of the company, who is spending the summer at Fleming.

THE LEASERS of the Novelty mine at Gold gulch are taking out a large amount of rich ore, and making considerable money in the development of the ledge. The lead has widened with every foot of work done upon it, and sinking is being pushed as rapidly as the nature of the ground, which is very hard, will permit.

SHIPMENT.—E. A. Anderson, who has the Malapais mine, at Gold gulch, belonging to Dorsey Bros. and Conway, under lease, made a shipment of 4,400 pounds of rich ore on Saturday to the Deming sampler. Regular shipments of 150-ounce ore will hereafter be made from this claim.

APACHE DISTRICT, in the southern part of the county, is attracting the attention of prospectors. They are flocking in there from every direction, and some are finding very encouraging surface claims. The mines being developed in the district are looking well, and regular shipments of ore may be looked for hereafter.

OREGON.

HEATH DISTRICT.—Bedrock *Democrat*, May 18: We received a call yesterday from Mr. Boggs, of Mineral City, who has lately been on a trip to Heath district, about 60 miles northeast of the Baker across Snake river, near Brownlee ferry. He presented us with a sample of galena ore from the mine of Summers & Wilkinson, which is the richest ever before seen in any country. This mine is situated in the same belt of mineral as that of the Ruth and Seven Devil districts, and has been prospected on an incline shaft to the depth of 80 feet and then by several cross-cuts. The vein at this depth is 17 feet between walls, and the ore becomes richer all the time. Adjacent to this mine are various other discoveries with more or less development made upon them which indicate vast richness. The mines of Ruthberg are receiving considerable development this year, and the discoveries are turning out richer than ever. Jas. Ruth, the original discoverer of this district, is pushing with all the energy possible the work of development on his several locations. It will be remembered that Mr. Ruth last summer disposed of one of his locations to California capitalists, receiving therefor the snug sum of $20,000. The parties buying this mine contemplate the erection of a mill upon this property the coming summer. At Mineral City, situated in the same belt of mineral as that of the Ruth, Heath and Seven Devil districts, is receiving quite a boom in mining this spring. It is attracting the attention of capitalists from abroad, and we would not be surprised to hear that one or more mills were put in operation there before the summer is over. If mining men desire to find the place they have been searching for so long, let them pay a visit to Mineral City and they will not be disappointed. The Black Maria mine has been developed to a depth of 120 feet with cross-cuts of 15 to 20 feet on each side, showing a fine body of ore. The owners of this mine are Messrs. Boggs & Landy. The Daniel Boone, Jolly Traveler, and numerous other discoveries are being developed extensively this spring, and all show great richness. Copper discoveries have also been made in this district, one, the Minnesota Chief, showing ore that has been assayed as high as 68 per cent copper, 19 oz. silver and $7.50 in gold. Three miles south of Mineral, on Wolf creek, discoveries have been made of galena and black sulphurets, one assay going as high 1,730 oz. silver to the ton. The belt of mineral in which all these discoveries have been made will prove some day to be the richest in the world. Mining men from abroad visiting there are amazed at the extent of the deposits of ore, and it is certain that some day the greatest boom in mining that has ever occurred will take place in this country.

PROSPECTING.—Jacksonville *Times*, May 23: Geo. Stephenson, of Ashland, took a couple of mining experts from California to Applegate this week. They propose prospecting the Steamboat district thoroughly. J. D. Shearer and W. E. Finney, of Steamboat, found a nugget of gold worth over $50 not long since. The latter brought it to town last week and sold it to Bilger & Maegly. Geo. H. Chiek, of Portland, the well-known mining expert, having leased the Morse & Jacob's quartz-mill at Henley, Cal., is now prepared to test gold and silver ores with his process, and guarantees to work any ore in this county to 85 per cent of fire assay. Miners should read his advertisement elsewhere. Considerable mining is yet going on in the Steamboat mining district. Finney & Prickett are rigging up a derrick with which to hoist the boulders out of their claim by water-power. Caldwell & Son are still piping with a fair head of water. Sargent & Co. are also busily at work, as are several others. That camp promises to be one of the best in this section in the near future. Capt. Arken is still sojourning at the Sterling mine, and will remain some time yet. It is the intention to build an immense reservoir there, to catch the surplus water, which has heretofore gone to waste, and work will be commenced at once. Plans were received from California last week. The reservoir will, no doubt, be one of the largest on the Northwest Coast. It will enable this company to run six months in the year, and insure profitable returns. The Sterling Mining Co. is to be complimented on its enterprise.

UTAH.

CHLORIDERS' CLEAN-UP.—Southern Utah *Times*, May 23: During the past week several of the chloriders at work on the river and white reefs have enlivened the town with their presence, they having had a "crushing." We are informed that the results obtained from their ores have been highly satisfactory to the men in most instances. The men have mostly gone back to the scene of their labors, and we shall not expect them back in force until they have another clean-up.

THE STORMONT COMPANY.—The Thompson furnishes five tons of first-class ore for the mill every day. The mines worked through the Buckeye and Savage shafts are looking well, and are producing about forty tons of ore daily.

THE CHRISTY COMPANY.—The Stormy King is producing eight tons of first-class ore daily. The mill, during the past week, crushed 41,642 tons of ore daily, and we learn from good authority that the ore pulped higher than at any time since the company resumed operations last fall. At present, the stopes are being worked on the third, fourth and fifth levels in the California, out of which thirty-five tons of first-class ore are sent to the mill every twenty-four hours. Prospecting is being vigorously pushed in different parts of the mine, and the indications throughout point to the fact that the California, in the near future, will surpass her production in the palmy days of the Reef

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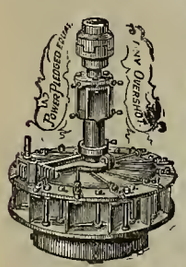

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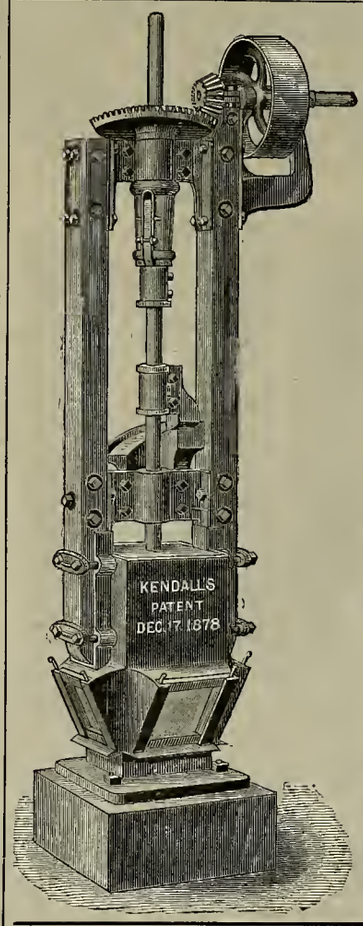

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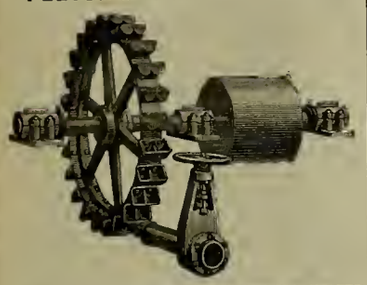

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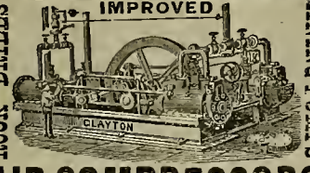

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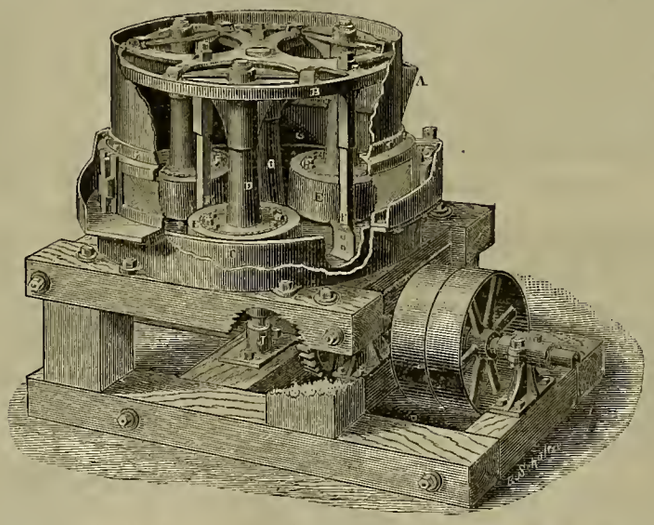

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A Glance Over the Mining Field.

The Butte, Montana, mills and smelters are working ore at the rate of 1,600 tons every 24 hours.

The total disbursements of the Ontario mine, Utah, last year were $2,413,914, of which $975,000 was paid out in dividends.

The Moulton mill at Butte, since its late reduction in custom rates, has its ore-house full to overflowing with ore for custom treatment.

Several parties from Austin are working on claims they have bought or taken up at Bernice, Nev., and all express the opinion that the camp is a second Austin.

George Lovelock shipped a carload of nickel and cobalt ore from the Cottonwood mines last week. The ore, which is shipped to Europe, is worth about $140 per ton.

The Omaha and Grant Smelting and Refining Co. took out of ore for the year 1884 $13,751,185, of which $1,600,000 was gold. This is a very large showing for one concern.

The Mahoney mine, Sutter Creek, Amador, after starting up ran only three days, when work was again stopped, pumps disconnected and the mine allowed to fill with water.

A number of mining camps are desirous of having sampling works. Hundreds of men would work in many places where they are now idle, if they could realize on their quartz.

The new company operating in Hiko, Nev., is pushing work ou its property. The mine is presenting a better appearance at the present than anticipated. About 14 men are employed extracting ore. The mill will soon be in readiness.

The little 5-stamp mill owned by the Ferrington Brothers, situated in the Garfield district, says the Eureka *Sentinel*, continues to ship hullion constantly, steadily and in large amounts. Two shipments per week are the average, and each is valued at from $6,000 to $8,000.

About 40 Chinamen are working the placers at Spring Valley, Nevada. Water is scarce and the Chincse burrow underground and get the rich gravel from the hedrock without disturbing the surface. They have honey-combed a large area in that way, and wash the gravel extracted in rockers.

The smelter at Cliff, Idaho, will soon be blown in on silver ores. This will give scores of prospectors who have small quantities of ore on the dump an opportunity to realize sufficient cash to enable them to go ahead with development work. It will also give an impetus to the large producing mines in the vicinity of Houston.

During the quarter ending March 31st, the small mines of Eureka county, Nevada, produced and worked over 11,000 tons of ore, the gross yield or value of which was about $210,000. Most of the small mines are worked on a very limited scale hy leasers and tributers, and hut few of them are worked below a depth of 150 feet. Tbis speaks well for the county when one cnnsiders the depression which has overtaken the mining industry of the Coast.

The new reduction works of the Eureka Con. Company are fast approaching completion. While the new plant will have for a while hut one furnace, yet in other respects it is extensive and probably one of the most complete on the Pacific Coast. Should the future justify the erection of additional furnaces the location of the present one is such that new ones cau he readily and practically added.

When Geore D. Roherts, the famous mining operator, was on the Comstock a few years ago, in speaking of Leadville, he said it was just as rich and flourishing a place as ever, and that more bullion was taken out of the mines there last year than in any one previous year. At the head of California gulch, within the borders of the town, another heavy vein or deposit of rich carbonate ore has recently heen struck at a depth of ahout 200 feet.

On the 18th inst. a fire broke out at the original Keystone mine, three miles north of Virgioia, on the road to Reno, entirely destroying the hoisting works, extensive huildings and machinery. The large boarding-house and office of the company, also the wagons and harness, were savcd. No work has heen done on the mine for the last five years, and it was in charge of a watchman, who thiuks the fire was the work of an incendiary.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
J. J. BARTELL—Sacramento and San Joaquin Counties.
A. C. KNOX—San Louis Obispo and Santa Barbara Co.
G. W. INGALLS—Arizona.
M. S. PRIME—Alameda County.
MRS. OZIER—California.
E. L. RICHARDS—San Diego Co.
F. W. SMITH—Tehama, Shasta and Trinity Co.
W. B. TURNER—California.
L. J. SAFLEY—Alameda Co.
GEO. MCDOWELL—Fresno Co.

THE Mexican annual rainy season began tbis year six weeks in advance of its usual time, but no apprehensions are felt, for, during the past two seasons, the Northern Mexican States have experienced very severe droughts.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCA'N.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alta S M Co	Nevada.	32.	25.	Apr 30.	June 4.	June 24.	W H Watson	302 Montgomery st
Baker Divide M Co	California.	9.	25.	May 12.	June 15.	July 6.	D M Kent	330 Pine st
Buchanan G M Co	California.	12.	15.	Apr 14.	May 18.	June 5.	P J Sellwan	121 Post st
Belmont M Co	Nevada.	39.	15.	Feb 11.	May 7.	June 1.	J W Pew	310 Pine st
Chollar M Co	Nevada.	16.	50.	May 11.	June 24.	July 15.	C E Elliott	309 Montgomery st
Con Imperial M Co	Nevada.	22.	10.	May 20.	June 20.	July 15.	C L McCoy	329 Pine st
Champion M Co	California.	19.	08.	Apr 23.	June 1	June 19	T Wetzel	522 Montgomery st
Entrnacht Gravel M Co	California.	18.	05.	May 26.	June 30.	July 18.	H Kunz	209 Sansome st
Endowment M Co	Nevada.	5.	50.	May 19.	June 22.	July 20.	E M Hale	327 Pine st
Golden Fleece C M Co	California.	1..20.	00.	Apr 18.	May 25.	June 15.	F Schirmeier	Phelan Block
Hale & Norcross S M Co	Nevada.	85.	50.	May 6	June 9.	June 29.	E B Holmes	309 Montgomery st
Iowa M Co	Nevada.	17.	05.	Apr 29.	June 6.	June 27.	C C Leavitt	510 Battery st
Julia Con M Co	Nevada.	23.	10.	Apr 6.	May 13.	June 5.	J Stedfeldt	412 California st
Loreto M and M Co	Mexico.	08.	15.	Apr 28.	May 29.	June 22.	H G Jones	327 Pine st
Mexican M Co	Nevada.	55.	20.	Apr 20.	May 23.	June 13.	G D Edwards	414 California st
Navajo M Co	Nevada.	11.	25.	May 25.	June 29.	July 20.	J W Pew	310 Pine st
Overman S M Co	Nevada.	55.	20.	Apr 20.	May 23.	June 12.	G D Edwards	414 California st
Potosi M Co	Nevada.	18.	30.	May 13.	June 19.	July 10.	C E Elliott	309 Montgomery st
Pinal Con M Co	Arizona.	6.	06.	Apr 10.	May 18.	June 8.	W Letts Oliver	328 Montgomery st
Puget Sound Iron Co	Wash Ter.	11.	50.	Apr 14.	May 25.	June 25.	A Halsey	328 Montgomery st
Peerless M Co	Arizona.	4.	50.	May 18.	June 23.	July 17.	A Waterman	309 Montgomery st
Santa Anita M Co	California.	8.	02.	Apr 23.	May 26	June 16.	J M Buffington	309 California st
Sulphur Bank Q M Co	California.	3.	50.	Feb 25.	Apr 16.	Jun 1.	L Hermann	220 Sansome st
Union Con M Co	Nevada.	30.	25.	Apr 16.	May 20.	June 9.	J M Buffington	309 California st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Crown Point M Co	Nevada.	J Newlands	329 Pine st	Annual	June 1
Chalcedony Mfg Co	Arizona.	I Adams	318 Montgomery st	Annual	June 9
Gagnere M Co	California.	G R Wilson	402 Montgomery st	Annual	June 2
New Era G M Co	California.	A L Fuller	413 Montgomery st	Annual	June 13
Summers Con M Co		F E Luty	330 Pine st	Annual	June 5

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Kossuth M Co	Nevada.	C K Sturtevant	328 Montgomery st	06	Mar 16
Mt Diablo M Co	Nevada.	R W Heath	318 Pine st	20	May 28
Navajo M Co	Nevada.	J W Pew	310 Pine st	25	Feb 13
Plymouth Con G M Co		W Van Norden, Pres.	23 Nassau st, N Y	50	Apr 6
Silver King M Co	Arizona.	J Nash	328 Montgomery st	25	Feb 16
Syndicate M Co	Nevada.	J Stadfeld Jr	419 California st	10	May 5

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE. May 20-27	Portland. Rain	Temp.	Wind	Weather.	Red Bluff. Rain	Temp.	Wind	Weather.	Sacramento. Rain	Temp.	Wind	Weather.	S. Francisco. Rain	Temp.	Wind	Weather.	Los Angeles. Rain	Temp.	Wind	Weather.	San Diego Rain	Temp.	Wind	Weather.
Thursday	.39	56	S	Cy.	.00	72	NW	Cl.	.00	68	NW	Cl.	.00	60	W	Cl.	.00	75	W	Cl.	.00	72	S W	Cl.
Friday	.25	54	NW	LR.	.00	68	NW	Cl.	.00	68	NW	Cl.	.00	63	W	Cl.	.00	76	W	Cl.	.00	70	S W	Cy
Saturday	.92	63	S	Fr.	.00	76	N	Cl.	.00	71	NW	Cl.	.00	65	W	Cl.	.00	77	W	Cl.	.00	69	S W	Cl.
Sunday	.00	67	N	Cy.	.00	78	S	Cy.	.00	73	S W	Cy.	.00	61	W	Cy.	.00	78	W	Cl.	.00	72	S W	Cl.
Monday	.12	62	S	Cy.	.00	78	S	Cl.	.00	73	W	Cl.	.00	62	W	Cl.	.00	77	W	Cl.	.00	72	S W	Fr.
Tuesday	.13	60	S	Cy	.00	83	N	Cl.	.00	73	NW	Cl.	.00	62	N E	Cl.	.00	75	S W	Fr.	.00	72	S W	Cy.
Wednesday	.00	67	N	Fr.	.00	88	N	Cl.	00	82	NW	Cl.	.00	75	NW	Cl.	.00	79	W	Cl.	.00	68	00	Cl.
Totals	.91				.00				.00				.00				.00				00			

EXPLANATION.—Cl, for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature wind and weather at 12:00 M. (Pacific Standard time), with amount of rainfall in the preceding 24 hours.

Mining Share Market.

Stock dealers here continue to await developments on the Comstock, more particularly in the middle mines. The water is out again and the men are at work cleaning out the lower levels of the Hale and Norcross. Now the proposition is to go ahead with the promising ore development found in those lower levels. On the 2,900 level of the Hale and Norcross it is not deemed advisable to do much at present because of lack of air circulation and other difficulties, but on the 3,000 level, where the ore development was the most interesting, the best results may be looked for from work resumed. While cross-cutting west to prospect and work the valuable ore vein at that point, it is under consideration to run the main north lateral drift further north, in order to intercept the ore vein from the level above. Perhaps even deeper sinking may be deemed necessary in order to further practically develop the present prospect, but this will be a matter accomplished with good facility and at comparatively small expense, as the present plant of machinery of the Combination shaft is fully sufficient to sink the shaft 500 feet deeper, if required, and to keep the mine well drained.

At the south end the Yellow Jacket Crown Point and Belcher continue their large yield of fair-grade ore from the old upper levels, employing between 600 and 700 men. Low-grade ore is being yielded by the Woodville and the Overman, and some very high-grade ore is found in the Baltimore. The *Enterprise* says that this is found in a small, narrow vein of a few inches in width in the midst of the great Comstock ore belt, which at that point is several hundred feet in width. But the most phenomenal part consists in the fact that this little vein or ore streak partakes considerably of the character of the famous "razor blade" ore veins of Reese River district, not only in size but in ore itself. Ruby or antimonial silver enters so largely into its composition that, unlike the general free-milling ores of the Comstock, this requires to be worked by the dry roasting chlorination process. Some specimens of the genuine ruby silver from this peculiar vein assay high up in the thousands per ton. Ruby or antimonial silver has also been found in the Justice mine and others at the south end, but very little, if any, in the northern section, except as mixed with the base ores of the Ophir and some other mines. This vein is distinct in its general characteristics from all other ore streaks on the Comstock.

THE workingmen, at a meeting in Quebec, Montreal, passed a resolution requesting the Government to prohibit the importatioo of Chinese lahor into the Dominion.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING May 7.		WEEK ENDING May 14.		WEEK ENDING May 21.		WEEK ENDING May 28.	
Alpha	.95	1.00	1.00	1.30	1.10	1.40	1.20	1.35
Alta	.15	.25	.20	.40	.20	.40	.30	.35
Andes	.30	.55	....	.50	.45	.60	.55	.65
Argenta	....	....	....	.10	....	.05	....	.15
Belcher	1.00	1.05	....	1.20	1.10	1.30	1.20	1.25
Belding	....	....	....	....	....	....	....	....
Best & Belcher	1.75	2.75	2.40	2.95	2.80	4.65	4.00	5.00
Bullion	.35	.45	.40	.50	.35	.40	.40	.45
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	.25	.35	.20	.30	....	....	....	.25
Bodie Con	1.50	1.60	1.30	1.50	1.50	1.60	1.40	1.45
Benton	....	....	....	.10	.10	.15	....	....
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	....	.30	....	.30	.30	.50	.40	.45
California	.85	1.45	1.50	1.75	1.55	2.00	....	....
Challenge	....	....	.25	.30	....	.30	....	....
Champion	....	....	....	....	....	....	....	....
Chollar	1.30	1.50	1.20	2.50	1.60	2.35	2.10	2.50
Confidence	1.25	1.35	1.30	1.50	1.65	1.75	....	....
Con. Imperial	....	....	....	....	.15	.20	....	.10
Con. Virginia	.85	1.45	1.30	1.75	1.55	2.00	2.00	2.30
Cou. Pacific	....	....	....	....	....	....	....	....
Crown Point	1.35	1.45	1.35	1.56	1.35	1.65	1.40	1.45
Day	....	....	....	....	....	....	....	....
Eureka Con	7.20	8.75	5.75	8.87	6.25	7.50	7.00	7.12
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	.30	.35	.35	.40	.35	.40	.35	.45
Grand Prize	....	....	....	.75	....	.75	....	....
Gould & Curry	1.15	1.70	1.45	1.80	1.85	2.50	2.10	2.70
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	5.25	6.00	6.12	7.50	6.87	8.32	6.62	7.37
Holmes	....	....	....	4.00	....	4.30	4.50	4.75
Independence	....	....	....	....	....	....	....	....
Julia	....	.05	....	....	....	.10	....	....
Justice	....	.15	....	.15	....	.15	....	.15
Martin White	....	....	....	.40	....	....	....	....
Mono	1.15	1.45	1.15	1.40	1.20	1.25	1.05	1.25
Mexican	.60	.80	.90	1.25	.90	1.30	1.25	1.45
Mt. Diablo	....	3.80	....	....	....	3.85	....	4.00
Northern Belle	....	....	....	....	....	....	....	....
Navajo	1.10	1.70	1.05	1.35	1.20	1.30	.90	1.25
North Belle Isle	.10	.20	....	.15	....	.15	....	.15
Occidental	1.40	1.50	1.50	2.00	....	1.40	1.55	1.70
Ophir	.55	1.25	1.10	1.70	1.20	1.60	1.60	1.75
Overman	.10	.15	.15	.20	.20	.25	.35	.50
Potosi	.50	.65	.55	.95	.70	.95	.85	1.00
Pinal Con	....	....	....	....	....	....	....	....
Savage	2.65	2.95	2.90	3.65	3.60	4.10	3.85	4.15
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	.85	1.30	1.15	1.40	1.15	1.60	1.35	1.60
Silver Hill	....	.10	....	....	....	....	....	....
Silver King	....	....	....	....	....	3.00	....	....
Scorpion	.10	.15	.15	.20	.15	.25	.15	.25
Syndicate	....	.45	....	.35	....	.40	....	.40
Tioga	....	....	....	....	....	....	....	....
Union Con	.45	.80	.70	1.00	1.10	1.40	1.25	1.50
Utah	1.00	1.30	1.75	2.25	1.75	2.00	1.80	2.00
Yellow Jacket	2.25	2.60	2.50	3.00	2.75	3.10	2.65	2.85
....	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY A. M., May 28.

50	Alpha	140	Hale & Nor...6.75@6.87½
50	Alpha	50	Mexican
300	Alta	200	Mono
300	B. & Belcher	300	Ophir
400	Bullion	50	Overman
60	Bodie Con	400	Potosi
530	Chollar	510	Savage
321	Con Va & Cal..2.15@2.20	100	Sierra Nevada
50	Challenge	400	Union
50	Eureka Con	50	Yellow Jacket

AFTER the first day of July next the rates of postage in the United States will be lower than in any other country using the postal system. At that time the rate will he two cents for each ounce or fraction thereof, instead of a half-ounce, as at present.

Market Reports.

Lumber at Wholesale.

The Redwood Lumber Association has established no prices since the first of the year.

REDWOOD.—Cargo prices are at present as follows: Rough, merchantable, ₱ M ft., $13 00; Rough, clear and surfaced, $23.00; 1x10 Rustic, No. 1, $24.00; 1x10 Rustic, No. 2, $19 00; 1x8 V Rustic, No. 1, $22.00; 1x6, tongued and grooved, $21.00; 1x4, tongued and grooved, beaded, $23.00; ½-in x3, Battens (board measure), $30.00; Shingles, ₱ M, $1.65.

Pine—Rough, $15.00; No. 2, $12 00; do do in lengths, $13.00; rough, 40 to 50 ft lengths, $16.00; do 50 to 60 ft, $17.00; T and G Flooring, 1x6, $26.00; do do 1¼x6, $28.00; do do 1x4, $28.00; do do No. 2, $21.00; Vertical Grain T and G Flooring, 1x6, $30.00; do do do 1¼x6, $32.00; Stepping, $37.50; Furring, 1x2, per lineal ft, ¾ c.

Lumber at Retail.

Ices fixed by the association April 1st. are as follows:

Pine, Rough	$16 00
" " No. 2	12 00
" " 2 in lengths	13 00
" " 40 to 60 feet lengths	16 00
" " 50 " 60 " "	17 00
T. & G. Flooring 1 x 6	26 00
" " 1¼ x 6	28 00
" " 1 x 4	28 00
" " No. 2	21 00
Vertical Grain T. & G Flooring, 1 x 6	30 00
" " " 1¼ x 6, 1 x 4	32 00
Stepping	37 50
Furring, 1 x 2, per lineal foot	0¾
Redwood, Rough	17 00
" " No. 2	13 00
" Surfaced	30 00
" " 1 x 8	28 00
" " 1 x 6	28 00
" T & G. 0 in. 12 ft and over	28 00
" " " 7 to 12 ft	26 00
" " " under 7 ft	20 00
" Rustic	30 00
" " No. 2	25 00
" T. & G. Beaded 12 ft. and over	30 00
" " " 7 to 11 ft	25 00
" " " under 7 ft	20 00
" Siding, ½ in	22 50
Pickets, Fancy	26 00
" Rough Pointed	15 00
" " Square	14 00
Battens, ½ x 3 per lineal ft	0¾
Shingles	2 00
Laths, 1½	3 25
" 1½	3 75
Dunnage Boards less 5% delivered	16 00

Price subject to change without notice.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, May 28, 1885.

ANTIMONY—Per pound	@	—
Hallet's	12 @	—
Cookson's	13 @	—
BORAX—Refined	7 @	8½
IRON—Glengarnock ton	25 00 @	—
Eglinton, ton	23 50 @	—
American Soft, ton	27 00 @	—
Oregon Pig, ton	— @	—
Clipper Gap, Nos. 1 & 4	25 00 @	30 00
Clay Lane White	26 00 @	—
Shotts, No. 1	26 00 @	—
STEEL—English, lb	16 @	25
Black Diamond, ordinary sizes	13 @	—
Plow	6 @	8
Machinery	10 @	12
Sanderson Bros	13 @	—
COPPER—		
Braziers' sizes	— @	25
Fire-box sheets	28 @	—
Bolt	22 @	—
Yellow Metal	14 @	15
Ingot	14 @	15
LEAD—Pig	3½ @	3¾
Bar	5 @	—
Pipe	7 @	—
Sheet	8 @	—
Shot, discount 10% on 500 bag Drop, ₱ bag	1 85 @	—
Buck, ₱ bag	2 05 @	—
Chilled, do	2 25 @	—
TINPLATE—Oldcastle	5 75 @	6 00
Charcoal	5 75 @	6 75
Coke	5 25 @	6 50
Roofing	6 25 @	13 50
ZINC—German	9 @	10
Sheet, 7x3 ft, 7 to 10 lb, less the cask	9 @	10
QUICKSILVER—By the flask	33 50	
Flasks, new	1 05 @	—
Flasks, old	85 @	—
NEW YORK PRICES—		
California Borax, refined	8 @	8½
Pig Iron, American	17 00 @	18 00
Quicksilver	41½ @	—
Lead	3 70 @	—
Copper	11½ @	—
Tin	18½ @	—
Bar Silver	1 07½ @	—

Bullion Shipments.

Moulton, May 12, $17,280; Alice, 13, $15,156; Lexington, 15, $28,432; Homestake, 16, $6,000; Germania, 19, $4 446; Christy, 19, $1,600; Kentuck, 19, $7,000; Christy, 20, $1,770; Hanauer, 19, $7,500; Queen of the Hills, 19, $2,900; Crescent, 19, $5,100; Mayflower, 19, $2,450; Christy, 21, $1,510; Honerine, 21, $4,060; Hanauer, 21, $2,450; Queen of the Hills, 21, $1,300; Hanauer, 22, $5,000; Stormont, 21, $3,950; Hanauer, 23, $2,650; Queen of the Hills, 23, $2,800; Christy, 24, $1,700; Germania, 24, $4,036; Hanauer, 24, $5,200; Queen of the Hills, 24, $1,200.

Following were the ore and bullion shipments out of Salt Lake during the week ending 24th inst: Eighteen cars of bullion, 453,772 pounds; twenty-eight cars of ore, 792,610 pounds; one car of copper ore, 26,300 pounds.

TRAVELING REPRESENTATIVE, FRANK W. SMITH, formerly of this city, now traveling representative of THE MINING AND SCIENTIFIC PRESS, arrived on this afternoon's train from San Francisco. Frank has recently returned from a 3-months' tour of Arizona, New and Old Mexico mining districts and is now en route to Shasta, Trinity and other northern counties. He will write up the merits of the various mining districts for that ahle authority on mines and mining, THE MINING AND SCIENTIFIC PRESS. His writings ou southern mines and on mining matters have heen copied extensively by the press, and our home capitalists as well as mining men throughout the Coast will read his observations on our neighboring 'counties' mineral resources with interest.—*Red Bluff Peoples' Cause.*

List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING MAY, 19 1885.

317,983.—PURIFYING WATER FOR BOILERS—Chas. Elliott, S. F.

318,425.—APPARATUS FOR STORING OIL, ETC.—A. J. Gould, Quincy, Cal.

317,998.—MEAT SAFE—Mary J. Holt, S. F.

318,115—RULE AND PENCIL POCKET—Hunt & Bressler, Crescent City, Cal.

318,117.—CENTRIFUGAL CRUSHING-MILL—F. A. Huntington, S. F.

318,006.—FUSE CUTTER—J. M. Martin, S. F.

318,200.—WINDOW SHELF—J. G. O'Neill, Nevada City, Cal.

318,133.—BATHING SUIT—J. J Pfister, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

ARTIFICIAL FACING BLOCK FOR BUILDINGS. Henry G. Fieke, S. F. No. 317,107. Dated May 5, 1885. This consists of a framework of considerable size, made of longitudinel parallel strips having other strips nailed to them transversely near the ends, so as to form an open central space, these strips being built up to the desired hight for the block end afterward having the end filled in with a compound of concrete or artificial stone.

CARTRIDGE.—Wm. Suhlett, S. F. No. 317,041. Dated May 5, 1885. This invention relates to an improved method of loading shot-guns or shot-cartrides, and it consists in the employment of metallic or other weds and a metallic cylindrical case with sides either opened or closed, within which the shot are contained and kept together until after they leavs the gun. The shot are kept in a compact body some little time efter they leave the gun, which increases their range and penetration.

PAVING BLOCK.—Henry G. Fiske, S. F. No. 317,108. Dated May 5, 1885. This sidewalk or paving block consists of strips of hoard or other material laid horizontally side hy side to produce the desired length and width, a series of strips laid transversely ahove, these layers being continued until sufficient thickness is produced. Between and around these layere is a filling of asphaltum and coal-tar, which binds the whole together, and the exterior of the block so composed may have a permanent surrounding strip if eo desired.

GRIP FOR CABLE RAILWAYS.—Wm. A. Burke, S. F., assignor of one-half to F. Patek. No. 317,619. Dated May 12, 1885. This is an improvement on the grips for ceble roads, hy which connection is made between a car and an endless traveling rope moving in the tube heneath the street surface. It consists of a mechanism hy which the gripping jaws are caused to approach each other and a means for more perfectly protecting the working parts from dirt or injury.

PENCIL AND RULE POCKET.—J. W. Hunt and J. Breseler, Crescent City, Del Norte Co. No. 318,115. Dated May 19, 1885. This is a pocket or casing for conteining a carpenter's rule and pencil, end adapted to he secured to the overalls or working trousers in any convenient position. The invention consists in a metel pocket or casing edepted to receive the rule and pencil, and secured to a suitably folded piece of fahric, hy which the device is attached to the overells. This pockct can he readily secured to overalls or trousers in a convenient position, and adjusted, when necessery, to a new pair.

BATHING SUIT.—John J. Pfister, S. F., No. 318,133. Dated May 19, 1885. The patent covers a novel knit bathing suit as a new article of manufacture. It consists in a suit, one of the hody together with one leg and stocking of which are knit in one continuous cylindrical piece or strip, and united down the hack to the other half of the hody, which, together with the other leg and stocking is knit in a similar menner. Arm holes are cut on the body for the reception of the sleeves, and a peculiar auxiliary flap covers the shoulders end extends a short distance down the hack and front.

SUPPORT FOR CENTERS FOR MASONRY ARCHES.—Chas. H. Ackerson, S. F. No. 317,072. Dated May 5, 1885. This is a means for supporting the temporary centerings upon which masonry arches are huilt; and it consists of links which are fitted to hang from the edges of the girders between which the archee are built, and to support the ends of the temporary arches so that they are suspended from the girders. Mr. Ackerson has links adapted to receive the ends of the temporary arch-pieces of masonry centerings, and having their ends hent so as to hook upon and he supported hy the flanges of the girders hetween which the arches are built.

SIDEWALK AND PAVING BLOCK.—Henry G. Fiske, S. F. No. 317,106. Dated May 5, 1885. This consists of an asphaltum or concrete block, either with or without en interior framework of wood, and a supplemental outer coating or covering nf stone, which mey be applied to ths top and sides of the block. The present invention is an improvement on a former ono patented by Mr. Fiske, in which a framework of longitudinal and transverse strips is united togethsr and surroundad and filled with a compound of rock or gravel and asphaltum and coal-tar or concrete, so as to form e paving or sidewalk block. In the present invention an exterior coating of artificial stone is formed, which covers tho top and sides of the block.

RAILWAY STATION SIGNAL. Arthur A. Sprague, San Rafael. No 317,590. Dated May 12, 1885. This invention reletes to a railway signal whereby passing trains may be signaled. It consists of a case supported nn an arm which projects from one side of the station, or other convenient poiut, one end of ths case heing formed with opaque sides and the other end having transparent glasses in tho sides, so that a light which is set within that end may be seen from both sides and ths end. The opposits end contains a frame-work, heving colnred glasses or lenses set therein, and this is operated hy a mechanism connected within the interior of the ollice. In connection with this lamp similarly colored siguel boards or tsrgsts are employed, which are also connected with the same operating mechanism, so that they will be moved in conjunction with the glasss.

SEED-SOWER.—Jacob Price, San Lsendro. No. 317,013. Dated May 5, 1885. This is one of that class of hroadcast scsding machinss in which a rotating distrihutor receives its grain from a hoppsr and dischargss it over the ground. The invention consists in its peculiar construction and arrangsment with relation to each other of the hopper, the rotating distrihutor and the elevator. It also consists in dstails of construction relating to the regulation of the feed, to the hase frame of the machine and to the manner of its attachment to the wagon, and to the gearing devices hy which power is transmitted from the wagon to the elevator and distrihutor. The object is to provids an easily hendled seeder, and one capable of doing good and effective work, hoth with regard to the extent of the work in a given time and to its quality with respect to an even distrihution.

Mining Notes from Soulsbyville, Cal.

EDITORS PRESS:—Mining notes in this vicinity are very scerco at the present time. The Soulshy mine is ahout tbe only one that is turning out any gold. About two weeks ago a chute of rock was struck in the south end of the mine. The vein is good eize end the rock exceedingly rich with gold and lead eulphurets. It hae not been worked out in the lower levels; there is no douht but what it continues down eeveral hundred feet. They inform me that the largest chunke of quartz that ever went into the mill were taken out lest week, and the gold goes all through the rock. The town of Soulshyville depends principally on this mine, and it is very likely to make lively timee here the coming summer.

James Burns is erecting a whim on a river near Soulshyville to run a pump hy horse-power. One of his sons discovered this mine last winter; considerahle gold can he eeen in the rock. He has a great quantity of water to contend with. Mr. B. intends to prospect it thoroughly the coming summer.

H. W. Williams is sinking a shaft on his mine at Cherokee, and he took out some very good rock last week.

Nothing has been done on the Manzanita mine for a month past. The ownere had a good prospect and intend to prospect it more thoroughly in the future.

John Yosts's mine is idle. This is no doubt a good mine. The last work was done on it ahout a year ago.

The Basin mine, which is across the Tuolumne river, is looking fine. Several San Francisco partiee have heen up examining it, hut as yet have not made the purchsse. They have six veins, three small and three principals. No. 1 is sulphurets, no free gold to speak of, hut the sulphurets are very rich, end the size of the vein is ahout three feet. The middle vein (principal) is free gold and very rich. The size of the vein is ahout two feet. The upper vein (principal) is free gold and is also very rich. The vein is two or three feet in width; all the small veins are from eight to ten inches and prospect well. This mine is in the hands of poor men, and they have no capital to put up machinery. If this mine were in the hands of men who have capital to put up mechinery, it would he valuable property.

I will recommend any one who wants to purchase a good mine to take hold of the Basin. If any one in San Francisco wants any further particulars concerning the mine, the editors of the PRESS are at liherty to give them my address. Yours respectfully, A MINER.

Soulsbyville, May 26th.

Don't Fail to Write.

Should this paper he received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if t is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

The Hill Triumph Ore-Mill.

I desirs to call the attention of mining men, and all whnm it may concern, to the following letter written to me by Mr. Wilson, of Galena, Nev., regardiug one of the Triumph ore-mills, recently put in operatiou nn his mine:

GALENA, NEV., May 8, 1885.

Mr. H. W. Rice—DEAR SIR: I think it is due you that I write you some of my impressions of Hill's Triumph ore-mill I purchased of you in March. I got it in position, and have had it running for the past two weeks. The mill is in every way more than Mr. Hill claims for it.

In quantity it will do all any one wants to do. The important part to me was, will it save the gold? My mine is quartz, oxidized iron and some clay.

It had been a question with me, will the gold amalgamate? The gold is very fine. The result in the working of the mill has been satisfactory. It saves a high percentage of the gold and mostly inside of the mill.

Below the plates and blankets we fail to find any free gold. The wheels and channels stand well so far, and show no signs of wear. The mill appears to be serviceable and durable, and no doubt Mr. Hill has struck the correct idea in his invention, and mining men should congratulate him on inventing an ore-mill to take the place of expensive stamps. I am well pleased with mine and think there will be more wanted in this camp soon.

Respectfully yours,
H. F. WILSON.

I am the manufacturer of the Hill Triumph Ore-Mills, and havo one of them in constant running order et my works, No. 56 Bluxom street.

I request mining men end thoss intercsted in mines especially to call and sse this mill, for I know it is of great velue to them.

H. W. RICE.

The Mountain Messenger, one of our best interior exchanges, end which is elways commendahly filled with local nsws, has commenced the thirty-second year of its existence, numhered consecutively from "one." Actually it is 33 years old, and this should hs the commencement of the thirty-fourth volums, its puhlication having heen commenced et Gibsonville, in the spring of 1852. But for some reason, upon its removal to La Porte the numhering was begun anew, although no change of ownership took place. Thers are hut two or three papers in the State that can show as long en existence. In all this third of a century, with the exception of a fsw weeks aftsr the fire which destroyed La Porte in 1861, there has heen no failure of its weekly issus. It has seen the rise and fall of many mining camps, and sometimes their rehahilitation. The paper is vigorous, and, puhlished as it is in a prosperous region, bids fair to have a long and usseful existence.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests epecially represented in its columns. Persons eo receiving copies are requested to examine its contents, terms of eubscription, and give it their own patronage, and, as far as practicahle, aid in circulating the journal, and making its valumore widely known to others, and extending ite influence in the cauee it faithfully eerves. Subscription rate, $3 a year. Extra copiee mailed for 10 cents, if ordered eoon enough. Personal attention will be called to this (ae well as otber notices, at times), hy turning a leaf.

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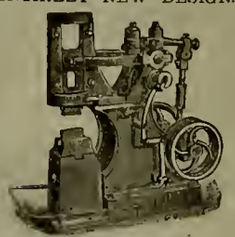

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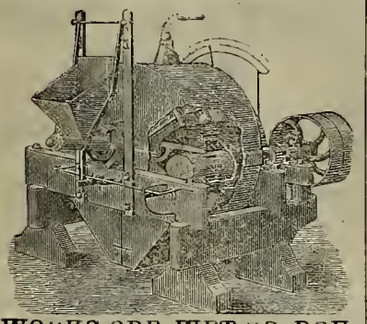

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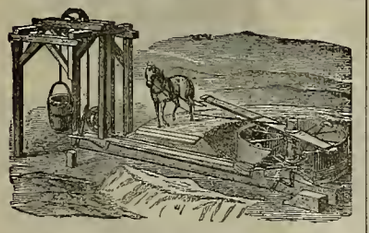

ONE HORSE CAN EASILY HOIST OVER 1,000 LBS. at a depth of 500 feet. The Whim is mainly built of wrought iron. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending the bucket. The standard of the whim is bolted to bed-timbers, thus avoiding all frame-work. When required, these whims are made in sections to pack on mules.

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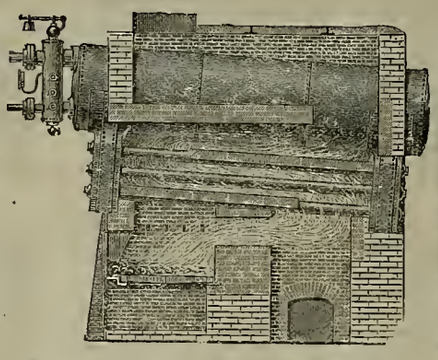

TESTIMONIALS.

SAN FRANCISCO, Sept, 19, 1884.

Risdon Iron and Locomotive Works—Gentlemen: We have had one of your Heine Patent Safety Boilers in use for four months at our Borax Works, in Alameda. It does good work and gives perfect satisfaction. Yours truly,
(Signed) WM. T. COLEMAN & CO.

SAN FRANCISCO, Oct. 4, 1884.

Risdon Iron and Locomotive Works—Dear Sirs: I am using one of your Heine Patent Safety Boilers in my Candy Factory on Twenty-Third street, near Valencia. For economy of fuel, safety and efficiency I have never seen its equal. Very truly yours,
(Signed) W. S. TOWNSEND.

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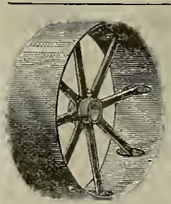

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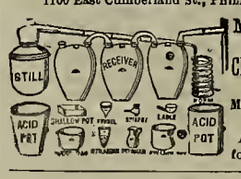

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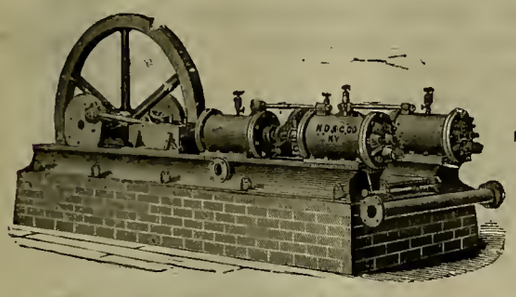

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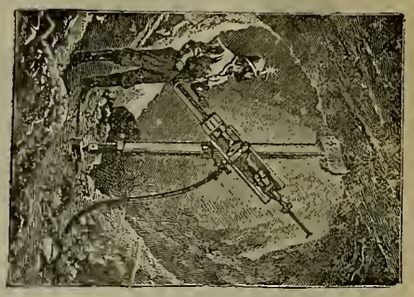

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For COPPER and ARGENTIFEROUS LEAD ores of NEW and ORIGINAL DESIGNS, covered by LETTERS PATENT. No other Furnace CAN COMPARE with these for DURABILITY, and in CAPACITY for uninterrupted work. MORE THAN 150 of them are now RUNNING in various parts of THIS COUNTRY, as well as many in FOREIGN COUNTRIES, giving results NEVER BEFORE ATTAINED as regards CONTINUOUS running, ECONOMY of fuel, AMOUNT and QUALITY of BULLION produced. These CLAIMS have been PROVEN BY RESULTS in ANY NUMBER of INSTANCES, and the GREAT SUPERIORITY of this SYSTEM of smelting ores DEMONSTRATED BEYOND QUESTION. COMPLETE PLANTS furnished to order of any CAPACITY, with ALL IMPROVEMENTS that experience has DEMONSTRATED as VALUABLE in this class of work.

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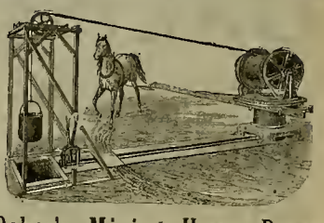
This machine has been THOROUGHLY TESTED for the past TWO YEARS, under a GREAT VARIETY of CONDITIONS, giving most EXTRAORDINARY results FAR IN ADVANCE of anything EVER BEFORE REALIZED. A recent COMPETITIVE TEST at the Carlisle Mine in Mexico, showed an ADVANTAGE OF OVER 30 PER CENT in favor of THE DUNCAN. The amount SAVED OVER THE FRUE being sufficient to PAY THE ENTIRE COST of the machines EVERY MONTH OF THE YEAR. One of its MOST VALUABLE features is as an AMALGAMATOR. It saves all THE AMALGAM GOLD and SILVER that ESCAPES the BATTERIES, PANS or SETTLERS, making the machine worth MORE than ITS COST for THIS PURPOSE ALONE.



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Possessing all the requirements of a first-class hoist, and affording means for the continuous operation of a Pump or Blower, without interfering with a hoisting apparatus. It is made entirely of iron, no piece weighs over 300 pounds. At the ordinary speed of a horse, a 1,000-pound bucket of ore may be raised 120 feet per minute. The hoisting-drum is under the complete control of the man of the shaft, and is capable of carrying 500 feet of five-eighths steel rope. SEND FOR CIRCULAR.

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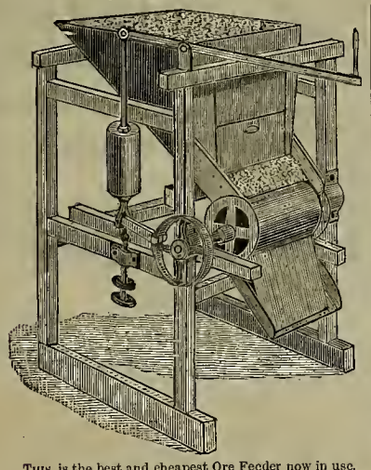
THE ROLLER ORE FEEDER

[Patented May 28, 1882.]



THIS is the best and cheapest Ore Feeder now in use.

It has fewer parts, requires less power, is simpler in adjustment than any other. Feeds coarse ore or soft clay alike uniformly, under one or all the stamps in a battery as required.

In the Bunker Hill Mill it has run continuously for two years, never having been out of order or costing a dollar for repairs.

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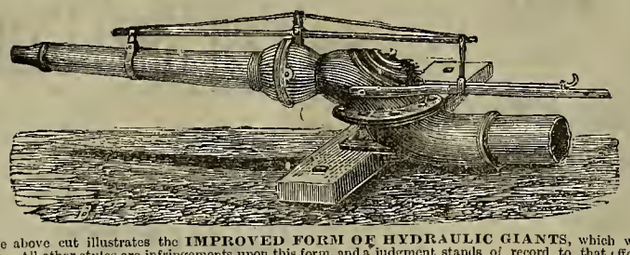
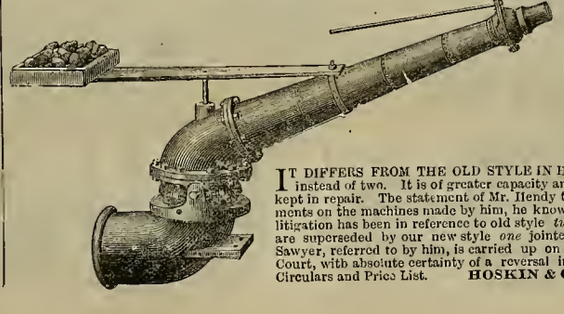
IMPROVED FORM OF HYDRAULIC GIANTS.



The above cut illustrates the IMPROVED FORM OF HYDRAULIC GIANTS, which we manufacture. All other styles are infringements upon this form, and a judgment stands of record to that effect, under the decision of Judge Sawyer of the U. S. Circuit Court in the matter of Hendy and Fisher vs. R. Hoskin et als.

☞PRICES furnished upon application to

JOSHUA HENDY MACHINE WORKS,
39 to 51 Fremont St., San Francisco, Cal.

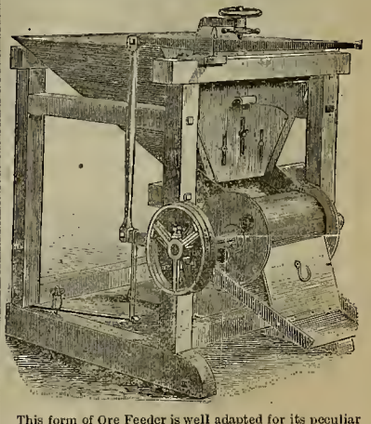


THIS CUT REPRESENTS OUR
IMPROVED
HYDRAULIC
MACHINE.

IT DIFFERS FROM THE OLD STYLE IN HAVING ONLY ONE JOINT instead of two. It is of greater capacity and more easily worked and kept in repair. The statement of Mr. Hendy that *all* styles are infringements on the machines made by him, he knows to be utterly false. All litigation has been in reference to old style *two* jointed machines, which are superseded by our new style *one* jointed. The decision of Judge Sawyer, referred to by him, is carried up on appeal to U. S. Supreme Court, with absolute certainty of a reversal in our favor. ☞Send for Circulars and Price List. HOSKIN & CO., Marysville, Cal.

THE ORIGINAL Roller Ore Feeder.

(PATENTED JUNE 24, 1873.)



This form of Ore Feeder is well adapted for its peculiar work.

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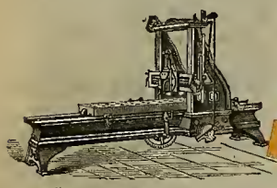
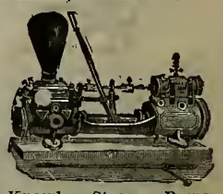


Putnam Planer.



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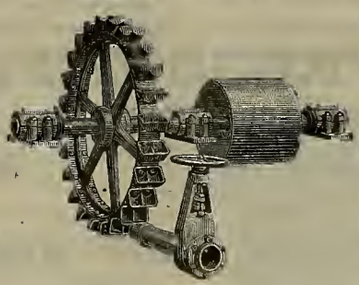
SEND FOR CIRCULARS.



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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JUNE 6, 1885.

VOLUME XLXX Number 23.

Shaft Sinking.

A New Method of Sinking Through Water Bearing, Loose Materials.

In the work of exploring certain gold-bearing gravels in the American valley, Plumas county, California, entrusted to the charge of Mr. James E. Mills, of Quincy, in that county, by Prof. Agassiz, of Cambridge, and Q. A. Shaw, of Boston, it became necessary to sink a shaft through loose materials containing in some layers large quantities of water. In doing this Mr. Mills was compelled to devise a new method, which has proved successful, and may be of service elsewhere. He described this method before the American Institute of Mining Engineers at the Chicago meeting, and has revised the paper for publication in the MINING AND SCIENTIFIC PRESS.

The American valley is a comparatively level tract of about 4,500 acres, surrounded with steep mountain slopes, which rise on the east, south and west to peaks of an elevation of about 3,000 feet greater than that of the valley. The flow of the valley is of loose materials—gravels, sands, clays, etc., and these rest in a rocky basin.

The lip of the basin at the lowest point of its rim where the waters leave the valley is 165 feet higher than the bottom of it, where the shaft struck the bed rock, and the surface of the loose materials at the shaft is 45 feet higher than the lip. There is, therefore, at the shaft, a thickness of 210 feet of gravel sands and clays resting in a bowl which receives water from a large area of mountain slopes. The shaft was sunk, by the method to be described, 20.7 feet further into the underlying bed-rock, making its whole depth 230.7 feet.

On geological grounds it was probable that the lower portions of the basin were filled with a mixture containing so much clay that water would pass through it slowly, and Mr. Mills tried to reach this comparatively compact material by the ordinary process of excavating and pumping out the water; but at 14 feet below the surface the inflow of water became 67 cubic feet per minute, and was fast increasing, and the material was fine and was running in under the shoe and casing down outside of the shaft. It was evidently impracticable to sink to any considerable depth through such material under the pressure existing when the water was pumped out of the shaft even if the water should not exceed the practicable limits of pumping.

[The shaft started for this purpose is shown at A, Fig. 1, of the accompanying drawings. It was rectangular and had an iron shoe Aa, which was pressed down with jack-screws as the excavation proceeded, and plank cribbing was built on as the shoe descended. Owing to the size of Fig. 1 of the engravings it is placed on page 365 instead of this page where it should properly come.]

Exploration with the drill was then made, and showed that for 60 feet the materials to be forced through were sands and gravels of a kind to run badly in places, and that below that depth, although the material as a whole was more clayey, there were at intervals strata of loose, open sands and gravels as far as the drill went, which was 170 feet. [There where geological data for concluding that its depth to bed rock was not more than 250 feet.]

The depth was too great to permit the use of compressed air to balance the pressure of the water. The Kind Chaudron process was not available, for the material would not stand unsupported for more than a few feet, in places not more than a few inches, much less for the whole depth. A cassion must be carried down with the excavation, and be kept pressed against the bottom.

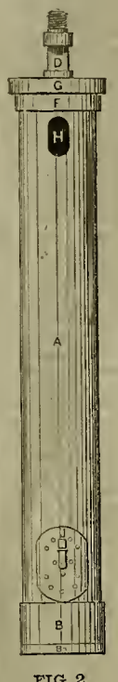

FIG. 2.
Scale 1 In. = 2 Ft.

FIG. 3.
Scale 1 In. = 2 Ft.

FIG. 4.
Scale 1 In. = 2 Ft.

FIG. 5.
Scale 1 In. = 2 Ft.

FIG. 6.
Scale 1 In. = 2 Ft.

FIG. 7.
Scale 1 In. = 2 Ft.

FIG. 9.
Scale 1 In. = 2 Ft.

FIG. 11.
Scale 1 In. = 2 Ft.

FIG. 10.
Scale 1 In. = 2 Ft.

Figs. 2 to 11.—TOOLS USED IN SHAFT SINKING.

The cassion adopted (B. Fig. 1, page 365 of accompanying drawings) is a cylinder of 55 inches outside diameter, of wrought iron one-half inch thick, leaving inside diameter 4½ feet. It is made of rings 4 feet long, and the rings riveted. Each ring is of one sheet, the ends of which are accurately planed and brought together edge to edge, and connected at the vertical joint thus formed by a vertical butt-strap of the same width and thickness as the horizontal one, and, like it, placed on the inside. The cassion is, therefore, a smooth cylinder on the outside, but on the inside the butt-straps project inward one-half inch. The lower edges of the horizontal straps are chamfered, the upper edges left horizontal. The vertical straps are thinned at the end to pass under the horizontal ones, so as to add to the projection of the latter not more than three-eighths inch. The rivets are three-quarters inch diameter, countersunk at both ends, and 2½ inches apart from center to center in the rows, and the two rows at each joint are same distance apart. The caulking was all done at the edges of the butt-straps. The lower part of the cylinder, which was to withstand the greatest pressure, was tested under a pressure, applied to the outside, of 150 pounds to the square inch.

The rings were put together in pairs where they were manufactured, making sections 8 feet long, so that there remained one horizontal row of rivets to be driven, and one horizontal seam to be caulked, to each eight feet in length of cassion, at the shaft.

At the lower end of the caisson is a shoe (Ba, Fig. 1) of rolled steel one inch thick, welded at the ends of the sheet to as to make a continuous ring without vertical seam. Its lower edge is not quite horizontal, but beveled so that the outer surface of the ring is one-quarter inch longer than the inner surface, making a cutting edge. It is scarfed to the ring next above, one-half of its thickness being cut away all around for a length of three and a-quarter inches, and the ring above lapping by for the same length, so as to rest on the shoulder of the scarf, and have its outside surface flush with that of the ring.

At the upper edge of the caisson there was always a butt-strap, projecting half its width. It would not do to bring to bear on this butt-strap the pressure necessary to force down the caisson; and a wrought-iron hand (Bh, Fig. 1), an inch thick and four inches wide was put there, resting on the edge of the main sheet, and surrounding the butt strap, and projecting one and one-half inches above the upper edges of the latter. The hand was in halves joined by bolts with nuts, as shown in the figure.

When the ground had been excavated and the caisson pressed down until its upper edge was 8 feet below the working floor, the hand was taken off, another section riveted on, and the hand put on top of the latter.

As the excavation proceeded, the caisson was forced down by hand with screws, reinforced toward the last by a falling weight.

The screws acted directly upon timbers 14 inches square on the end, resting on the hand above mentioned. The bottom of the timbers, which rested directly on the hand, was shod with 9 inches wide of wrought iron 1 inch thick. As the thread extended for only about 5 feet in length of the screws, blocking was put in between them and the lower timbers as the caisson went down, and removed when a new section was put on.

The screws, with their nuts and steps, are shown at C, Ca, Ch, Fig. 1, and need no further description, except that they were of strong cast-iron, called "gun-metal" in Boston,

(Continued on page 365.)

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Tuolumne Mines.

EDITORS PRESS:—I send you a short description of some of the mines located in and around the above-named place, and hope you will give it a place in the columns of your paper.

The first on my list is the famous Soulsby mine, which was discovered in the fall of 1857 by Ben Soulsby, who was placer mining at the time, and found float rock and traced it up and found the vein. He, with others, put up a 10-stamp-mill, and afterward added 10 more, and the first week's run paid for the mill and other improvements. It was worked by them till 1860. They then sold out to Donald Davidson, who afterward disposed of it to an English company. The mine has been shut down several times but was started up again. They have two hoisting works on the mine; several years ago the hoisting works on the south shaft was destroyed by fire, and was burnt down again in 1883. It was rebuilt, and is now one of the best works in the county of Tuolumne. At the present time they are taking out exceedingly rich ore, and the mine looks better than it has for several years. The rich ore is being taken out of the south end of the mine. There has been more gold taken out of the Soulsby than any other in the county; it runs up into the millions, but it is impossible for me to give the exact amount. The shaft is down 800 feet (more or less), and is now under the management of Mr. John Leechman.

The next on the list comes the Pennsylvania mine, which is the extension of the Soulsby, and owned by the same company. Some very rich ore was taken out of this mine years ago; it was idle for a great many years, and in 1884 the shaft was put down to 100 feet, and a slide came in and the vein was carried to one side, how far we cannot say; they drifted several feet, and not having any pump on the mine they shut down on account of water.

They have hoisting works on the mine and no doubt if further developed it will be as good as the Soulsby. The company will, no doubt, commence active work on it again in a short time.

Next comes the Platt mine which is a continuation of the Pennsylvania and Soulsby north shaft, 160 feet deep. The surface ground has been stoped out; it was done in early days when no one had the least idea that veins would continue down in hard rock. The shaft on the south end of the Platt is 150 feet deep, no machinery was put up on the south shaft to work the mine, and about 1866 it was closed down on account of the water coming in faster than they could keep it out with a common windlass; a good vein was left in the mine at the time it was shut down, and no work has been done since to open it.

The Raymond mine is also a continuation of the above mines. This was worked with a tunnel which was 90 feet from the surface, a chute of ore was worked out 300 or 400 feet long. A little work was done below the tunnel to about 50 feet. The last work was done by tributers; width of the vein was from 15 to 30 inches; good milling ore is now standing in the mine.

All of the above mines are the extension of the Soulsby, and that having been worked down about 800 feet there is no doubt if a little capital was spent to put up machinery and, etc., all of the mines would make good property, as only the surface ground has been stoped out and the mines were thrown idle. We have a few more mines, but little can be said about them, as not much work has been done on them. All of the above mines are south of the Soulsby. The Black Oak is no doubt good property. They have a vein in the bottom of the shaft three or four feet wide; last rock taken out paid about $1,200 a ton. Several companies has been up in the past few months, but as yet have not taken hold of it.

Live Oak is a continuation of the Black Oak. The rock taken out of this paid a very good price per ton in gold. The sulphurets are worth considerable.

Very good ore has been taken out of the Churchill, Independent and Gilson, but not much can be said about them at the present time.

It is the opinion of old miners at this place that there are millions of dollars in these mines if companies could be got to take hold of them and put out a little capital to open them up.

Soulsby & Bawden mine is to the north of the Soulsby, and it is supposed it is the extension. This mine was found in the same year as the Soulsby—1857, was not worked for some time, and it was then taken up by N. B. Dufficld and sold to a San Francisco company. After lying idle for several years it was worked by Soulsby & Bawden. They crushed rock in an arastra that paid from $60 to $70 per ton. Other parties then did some work on the mine while owned by them, and worked a short time and was shut down. In 1880 it was relocated by Westinghouse, who sold it out for a small sum, and it is now in the hands of a San Francisco company. The rock is the same in appearance as the Soulsby. All that is wanted on this mine to open it is a shaft put down 50 feet, and it would make a paying mine. A MINER.

Soulsbyville, May 25th.

California Day at the New Orleans World's Fair.

A Successful Demonstration.

California Day at the World's Fair was duly celebrated on May 7th, and we have had reports thereof from different sources. All agree that the demonstration was a success, and that great credit is due to Col. Andrews, Commissioner, and to others associated with him for the skill and zeal with which the arrangements were made.

The *Times-Democrat* gives the following outline sketch of the event: Without proceeding into the discussion of the events and features of California Day, the universal verdict may be given: Most successful. To begin with, the weather was charming; the sky just cloudy enough to hide the too direct rays of the sun. The wind was cool, and everything united to make of California Day a golden day worthy of the golden State. Long before the time announced for the commencement of the exercises the California headquarters were crowded with people, citizens of California and other States, all anxious to participate in the coming festivities. Each visitor to the headquarters was furnished with a blue badge beautifully embossed in gold, bearing the name of the State, the date of its admission to the Union, and various symbolical designs indicative of its prominence in the industrial arts. The ladies were all decorated with absolutely the most elegant badge of the Exposition year. It was composed of red, white and blue ribbons of heavy silk, and from the center of tho rosette depended a golden tassel, its connective point covered with a gold coin of Persian coinage. Of this coin a word may be said. It was not without reason that Col. Andrews chose this bit of money, for the cabalistic characters thereon guarantee good luck to the happy owner, and all ladies who were so fortunate as to obtain one should prize and wear it as a talisman against all earthly ills.

During the few moments consumed in waiting for the procession to start for the anditorium under the oaks, the assembled guests enjoyed a pleasant social reunion in the elegant and commodious headquarters of the California Commissioner. The hour so passed was a most enjoyable one, and Mrs. Andrews was indefatigable in her attempts to secure the enjoyment of the guests; an amiable occupation, he it said, in which this estimable lady has been engaged ever since her advent in New Orleans. After a few moments of waiting, in which the guests strolled through that admirable collection of the resources of California, the band arrived and the triumphal procession was formed. The band struck up an inspiriting air and the cortege moved down the long walk to the Main Building. Through the broad aisles of the great building the procession marched, and the stirring notes of the martial music and the rhythmical tread of the following cavalcade drew to the scene all the loiterers in the Main Building.

Leaving the great hall the procession marched to the auditorium under the great oaks. Here was assembled a large audience, who rose and cheered as the line of marchers, headed by Commissioner Andrews, Director General Burke and Dr. Beverly Cole, the Orator of the day, entered the reserved space.

The Ceremonies.

At about 2 o'clock the formal ceremonies of the day were opened.

On the platform sat Director-General Burke, Col. A. Andrews, Commissioner for California, Dr. Beverly Cole, Orator of the day, and others who were engaged in the ceremonies of the day; also a number of United States and State commissioners, and a host of Californians who were visiting or engaged in the Exposition.

The opening address of welcome was delivered by Col. Andrews, in which he said: "Our celebration to-day is simply for the purpose of promoting knowledge of our country and telling you all something of that wondrous land on the blue Pacific's shore, where gold and silver combine with fruits and golden grain to form that El Dorado sought in vain by the Spaniard, but discovered and developed by the ever restless and energetic American.

"Friends, I bid you welcome. Welcome to California's exhibit, and should any of you seek out our land, of which we have such pride, you will find there a welcome as hearty as that which I now extend you."

The address of Col. Andrews was received by the audience with great favor. After the applause had died away, the Commissioner introduced

Major E. A. Burke,

Director-General of the Exposition, who delivered an address, from which we quote as follows:

California and Louisiana.

In reflecting upon the relations of the State of California to this Exposition, and to its plans and purposes, it may not be inappropriate to recall to your minds the fact that this Exposition was not established to benefit any individual or any communities that were particularly interested in this locality; it was no merely for New Orleans; it was not for Louisiana; it was not even for the South alone. Its foundations and each and every one of its plans were broad and far-reaching plans, stretching out into futurity. We desire to build up the commercial prominence of New Orleans, it is true, and to advance Louisiana upon the high road of progress, and to line the South up with the progressiveness which has made our Eastern and Western States so rich and prosperous; but also we desired to show that here, upon this Southern soil, there was steadfastness of purpose, high enough and broad enough to reach out beyond mere local confines; that we could bring together the people and the exhibits of the whole country, and plant the banner that would lead forward to the accomplishment of high results in the future. [Applause.]

What part will California play in connection with the great plans and purposes of this Exposition? We know the relations it holds to our city, and to the great future we are building for it; we know of its gold and its grain, its fruits and its magnificent climate. We know of the vast stores we will draw from there, passing through our city on its way to the East and to Europe. It is no new dream—that of the vast trade and commerce that is to pass through and come from that city into New Orleans. The earliest step I made in manhood in the South was to come here with visions of the grand future of this city in connection with the extensiou of that great railroad system which has since been perfected between this city and California. I came here to take the superintendency of a section of this railroad, which had then been commenced, and which has been only recently completed. Even then we dreamed of a great, grand, broad-guage, double-track line from the Gulf to the Pacific, from New Orleans to San Francisco. [Applause.]

But aside from these points one of the plans and purposes upon which I desire to touch is that, having gathered together here in one vast array all the industries of this country, exemplifications of the thrift and the progress and the commercial development of the whole of our States and Territories, we must now press on to those unoccupied markets that America should years ago have seized upon. Upon this stand the other day I spoke of the $400,000,000 of trade that lies to the south of us in the markets of Latin-America. But across the 2,200 miles that lie between New Orleans and San Francisco and still further across the Pacific lies a great Oriental trade of $528,000,000 that belongs largely to this country, and that must come to us if we strive for it as we should. We know as regards the foreign exhibits of the Main Building that the first countries to accept the invitations of the Board of Management were China, Japan, Siam and Australasia. Why did they hasten to come to enjoy this feast? Because they knew, as we know, that the future will bring the trade of these countries, unless we continue to reject it, into the lap of America. And this grand system of railroad, stretching out from New Orleans to far-away San Francisco, why did it put forth its strength in making such magnificent contribution to the exhibit of California? They knew not only of the great interests that connected California with New Orleans as a shipping port to European countries for the products of their State, but they knew also that soon their line must become the great means of transit through the continent of the trade of the Orient. Then again, if no other sentiment impelled us, the honor the people and the Government of that State have done us by coming over 2,000 miles to our city to add the display of their grand and rich resources to our Exposition, demands our appreciation and our gratitude; and it would be a poor return, indeed, on our part, did we not both profess and feel an interest in the State sufficient to take up the question of the grand possibilities there presented to the country, and did we not acknowledge our interest and manifest our appreciation of the courtesy and honor they have done us.

Not only to the men of California and the Pacific Slope do we express our admiration and gratitude, but to the noble women of that State and of the slope, who have presented here over 2,000 specimens of the handiwork of the women of that section. And right here I desire to say that when the history of this Exposition is written, if ever it shall be written, the part that woman has played in it from its earliest institution will take a broad and dazzling prominence. She has been the aid and the inspirer of many of the very best of the features of this work; and not only by her labors, but by her pen has she accomplished this. The truth has been told and the falsehood has been exposed in thousands of instances that are never known in the general history of this Exposition. [Applause.]

After an address by Hon. L. B. McWhirter, of Tennessee, Mrs. Maria Sweazy was introduced, and read the following poem by Mrs. Florence A. Clarke, of Texas, entitled

Welcome to California.

[Written on the home bound Texas Pacific train, May 2, 1885.]

Beneath the shadows of the forest wild
Where mosses wave and water lilies lift
Their pearly chalices like holy priests
In nature's dim cathedrals, vaulted
With roofs of lapis lazuli enwrought
With emerald alt reliefs, where
Daylight melts into deep mysteries
Of twilight, in dense leafy solitudes
Where choristers unseen make balmy night
All vocal with their mellow harmonies,
Where over river, bayou, fen and pool,
The moonlight wears its mists of lucent pearl,
I call to greet thee, star of western skies,
Send back these lines, pale reflex of the thoughts
That glow within at mention of thy name.

O, California, with thy crown of snows,
Forever glistening in thy fervid sun,
Girdled with giant trees as with a zone,
Wrought by the Titans in esthetic mood;
And draped with water-falls, whose silvery spray
Flashes o'er sands of gold, whose jeweled feet
Are bathed by currents from far Asian seas,
Thou art all lovely, and thy sisters fair
Greet thee with loving pride—with open arms
Of fond affection. Art thou not our own?
Is not thy beauty ours, thy glory shared
With all Columbia's daughters? With the one
Who lately sat forlorn in weeds and woe,
With laughter hushed upon her blooming lips,
Her orange flowers and myrtles withered all,
And cypress twined about her lovely locks.

Fair Louisiana, thou hast cast aside
Thy mourning robes, and like a queen has bidden
Thy sisters from the North, the East, the West,
And thy own flowery South, to keep with thee
Thy feasts of roses, and in beauteous groups
They stand about thee, each in proud array,
And generous emulation, heart to heart,
Beloved and loving—all the past forgiven
And all the future spanned by God's own bow,
With promise of a long and prosperous peace.

Hail, California, and thrice welcome,
Land where the roses bloom in myriad homes
Like living gems; whose vines distill
Olympian nectar in their sun-kissed rows,
Whose fields of grain wave like wide golden seas,
Whose flocks and herds, like Jacob's, blessed of God
Gladden the pastures on a thousand hills,
Whose merchant ships with bales of costly silks
And ingots of pure gold dot the wide seas
With snow-white sails, like messengers of peace.

Hail, Western sister, lovely and beloved,
May He who dowered thee with royal hand
Protect thee from all harm—without from foes,
Within from unwise friends, and make the noon
Of thy full beauty perfect, as the dream
Pre-figured in thy dawning loveliness!
And may our States be close and closer knit
By iron bands and nerves of vibrant steel,
Among whose pulses flash electric thrills,
And in whose arteries beats the full, strong tide
Of life-blood from the common, central heart,
Until full grown in stately stature tall
They stand confessed before the assembled worlds,
The fairest galaxy amid the hosts
That gem the starry page of history.

So shall these daughters of the dawn fulfill
The prophecies of old, and light anew
The kindling flame of hope in world-worn hearts
Weary with watching the millenial day.
Hail, and farewell! I go to greet my own
In Texas's favored clime, yet send thee back
Imperfect greeting on the dusky wings
Of steam, the starry, swift angel
That flies o'er these wide waste fens,
Bearing glad messages of human love.
Peace be with thee. Hail and farewell.

After an enjoyable selection from tho band in attendance

Dr. Beverly Cole,

Of San Francisco, was introduced and made a most eloquent and enjoyable address, of which, unfortunately, no good report is given. It is stated, however, that the speaker concluded hy an eloquent reference to the Woman's Department of California, which in spite of the most adverse circumstances, contained no fewer than 2,000 exhibits, thanks mainly to the energy, tact and perseverance of Mrs. Lemmon, vice-president of the Pacific Slope, and the distinguished lady botanist of Califoinia.

After the Exercises.

The souvenirs given away on California Day were unique and beautiful. There were distributed 1,000 pampas plumes, 1,000 pieces of polished redwood, 20 boxes of oranges, and 1,000 miniature copies of *The Times-Democrat*.

After the completion of the exercises under the oaks a large number of guests repaired to the California headquarters, there to partake of the hospitality of the Commissioner. It was late in the evening ere the last man, loth to believe that California Day was past, departed for home.

A New Orleans paper says: One of the most delightful features of the California celebration was the concert in the Woman's Department. This space is becoming quite famous for musical entertainments, both advertised and impromptu, and music lovers feel duly grateful to Prof. and Mrs. J. G. Lemmon for the pleasure they have enjoyed at these musicales.

AN UNIQUE CARRIAGE.—A railway carriage of unique construction has been built for the South-Eastern Railway, England. The most noticeable feature of the carriage consists in its electro-plated steel paneling and electro-plated copper moldings. The electro-plating has been tried in order to avoid the expense and also the time occupied in repainting, which, owing to the numerous tunnels on the line, has proved to be a large item in the expenditure. The carriage throughout is of first class workmanship and finish, and the exterior of the body, with its bright surface of electro-plate, is said to present a remarkably handsome appearance.

WHEN the English dam on the headwater of the Middle Yuba river broke from its confines in June, 1883, the flood carried away a house and a lot of mining tools owned by the Rees Brothers, who were mining on the stream, buried their claim in debris and drowned Bradford Rees. The survivor now sues the Milton Mining Company for $25,000 for the loss of his brother's life and nearly $6,000 for damage to the property.

FISH are dying in great numbers in Sutterville lake, near Sacramento, and in other ponds. The trouble is attributed to grasshoppers, which, as food, appear to be fatal to fish, when taken in large quantities, as well as to turkeys.

MECHANICAL PROGRESS.

Must Have American Locomotives.

On the subject of American versus English machinery, Sir Julius Vogel, ex-Agent General for New Zealand, made a very interesting statement at Auckland on February 17th. Sir Julius, who is now the Colonial Treasurer, spoke for several hours on the past, present and future of New Zealand, and in the course of his speech used the following language: "We sent home an order for certain locomotives after a type which we had running in the Colony, and which were obtained from America. It was thought by the late Government unpatriotic to go to America for goods, so the plans and specifications were sent home to England, and the weights and sizes given most exactly. When these locomotives were about finished, the engineers telegraphed out that they were about to ship them, but that we had better order plant to strengthen our bridges and culverts, as it would not be safe to send the locomotives over them. Their idea was that we should make our railroads to suit their engines. We telegraphed that we should do nothing of the kind, that we had limited the weight of the engines. They replied they could not be made according to the specifications we had supplied. But the answer to that was that we had them running in the Colony, and we refused to take them. Well, this is what happened: We sent an order by telegraph to America for these engines, and such is the confidence we feel in the character of the material which will be supplied that we are prepared to take them without inspection there, while we cannot take the suspected ones from Great Britain." Sir Julius also made use of the folowing language: "I cannot help saying that under the free trade system of Great Britain there has been a great deal of scamped work and adulteration going on, and that buying in the cheapest market and supplying as cheaply as possible, manufacturers have been in the habit of not conscientiously supplying the best articles. It is only quite recently that by a happy accident—an iron axle falling to the ground and breaking while being unshipped—we were saved from sending forth death and destruction on our railways by using rotten axles sent out from Great Britain"

LEAKY BOILER TUBES.—Tube ends, according to the *Locomotive*, are a source of annoyance in some types of boilers that give rise to much trouble. This is especially apt to be the case with boilers of the vertical type. The upper ends are exposed to the action of the heated gases, and there being no water to prevent overheating, they are soon loosened and set to leaking badly. This gives rise to corrosion of the ends of the tubes and the upper head, which in many cases goes on with very great rapidity. It is no unusual thing to find the upper tube sheet of upright boilers eaten half way through and nearly all of the tubes leaking badly. This leakage is not so apparent from steam pressure as it is from water pressure. To the unpracticed boiler attendant everything may appear to be all right, but when the boiler is filled to the top with water, and pressure applied, there is generally some fun. The lower ends of tubes are also very apt to give more or less trouble, especially where upright boilers are used for heating purposes and the blow-off does not quite drain the boiler. This is generally the way uprights of the pot hung type are arranged, and during the summer months, when the boiler is standing idle, the interior of the shell and the tubes, just at the surface of the water left in the boiler, is subjected to severe pitting. Sometimes the tubes of this class of boilers are completely riddled in a very few seasons, whereas, if properly cared for, they should last many years.

THE INTERCHANGEABLE SYSTEM.—There has been some inquiry lately as to who first invented the interchangeable system of making machinery. It appears that the first use of the system was made in France in 1717, but was not a great success. In this country various efforts were made from time to time to use this system, but the details were not worked out sufficiently to make the system useful. Every one who tried it added something to the perfection of the system, but the man who probably did the most toward its perfection was Thos. Blanchard, whose inventions were used at the United States armory at Springfield. He brought out a lathe which would work accurately to any model, no matter what its form, and a little later a tool for mortising in the lock, which did its work perfectly. The first complete success under his system was achieved in 1842, when guns were made which dispensed with the old system of numbering and lettering. The interchangeable system rapidly spread to every detail of machinery manufactured.

WORKING IRON.—In discussing the question as to whether iron is improved with working, a writer on the subject thinks it can be shown that the metal can be overworked while in process of manufacture, or, at least, between much heating and much working it can be overdone—especially by the former. That the reheating of iron lessens the amount of cinder contained in it is proven by the fact that old furnace tools and grate bars, and much other old scrap iron that has been subjected to alternate heating and cooling, will, when fagoted and rolled, produce an iron of inferior quality. Iron is overworked when it ceases to work soft and easy from the liquid cinder that it should contain. Some iron possesses more cinder than others, and that which has much of it can be worked with advantage to its quality as long as the cinder holds out. To this extent, therefore, it can be improved by working, but not to the point at which a lack of cinder makes it work stiffly and dryly.

EFFECT OF MAGNETISM IN ELONGATING IRON.—The investigation of the changes brought about in the dimensions of iron and steel rods has been a tempting field for investigation to a number of scientists. Among the latest contributors to the literature of that special line of experimental work is Mr. Shelford Bidwell, who has lately announced his results in a paper read before the British Royal Society. He finds that the length of an iron rod is increased by magnetism up to a certain critical value of the magnetizing force, and if that is passed the elongation is diminished in proportion as the magnetizing force increases. The amount of the maximum elongation appears to vary inversely as the square root of the diameter of the rod. In soft steel magnetization produces elongation, and with hard steel the critical value of the magnetizing force becomes very high. In soft steel a temporary elongation once produced may be maintained by a magnetizing force too small in itself to produce any elongation. Nickel continues to retract with magnetizing forces far exceeding those which produce the maximum elongation of iron. The greatest observed retraction of nickel is more than three times the maximum observed elongation of iron, and the limit has not yet been reached.

THE LONDON INVENTORS' EXHIBITION was duly opened, according to announcement, on the 4th of May. It has met with good success both in the point of attendance and as an exhibition. It is thought the attendance will exceed 4,000,000 of persons. The American section was in a good state of forwardness at the opening. The watch department is pronounced as especially meritorious. In regard to this exhibit a late number of the English *Horological Journal* has the following: "While the Americans are preparing a large and complete display of watches and machine tools at the Inventions Exhibition, English manufacturers are, with few exceptions, obviously letting the opportunity slip. The poor show of English watchmaking may be partly accounted for by the fact that while the Americans appeal directly to the public, the industry here is conducted on different lines. Some of the largest manufacturers, who would otherwise have exhibited, abstain in deference to the prejudices of shopkeepers whom they supply, and smaller producers, who require to turn over their stock frequently, cannot afford to lock up a large capital for six months. Others fail to see a fair prospect of return for their outlay."

PHOSPHOR INGOT IRON OR STEEL which is claimed to be practically free from silicon and low in carbon, has been patented by J. P. Witherow and H. W. Oliver, Jr., of Pittsburgh, Pa. In producing the iron the inventors employ a stationary converter, and charge it with, say, 3,400 pounds of metal containing 1.8 per cent of silicon and .55 of phosphorus. The charge is blown with a low-pressure blast, beginning at seven pounds and then slowly reduced to five pounds. In five or six minutes the cinder will begin to flow from the cinder notch, and this flow continues from one to two minutes. The blow is continued, and then the metal is tapped off in a ladle and recarburized, if desired, by the addition of ferromanganese in the usual way. In this operation the charge is said to be practically desiliconized, while the phosphorous remains in the metal.

TO SHARPEN GLASS CUTTERS.—The following is a simple and easy method of re-sharpening this handy household tool: When the cutter gets dulled so that it will not cut, get a strip of soft metal—soft solder is best. Lead will do; but is rather soft. Zinc is rather hard. Run a groove, with the cutter, in the metal about five or six inches long; make up a little emery powder, not too coarse, with water; put the emery and water in the groove. Run the cutter backward and forward in the groove, putting on fresh emery if required. In about a minute your cutter will be sharpened. Wash out the emery from the cutter under the tap, dry, and put a little oil on it, and your cutter will cut as fresh as ever.

PROGRESS IN CANNON MANUFACTURE.—Scarcely 25 year ago the most powerful piece of artillery was a 68-pounder, throwing its projectile with a velocity of 1,600 feet per second. Now the weights of guns have been increased from 5 to 100 tons, the velocities from 1,600 to 20,000 feet per second, the energies from 1,000 foot-tons to over 52,600, and the projectiles from 68 pounds to 2,000 pounds.

TO WELD CAST-STEEL.—Take rock saltpeter, one-quarter pound, dissolve in one-quarter pound oil of vitriol, and add it to one gallon of water. After scraping the steel, get it hot and quench in the liquid, and then heat, and it will weld like iron. Better than horax.

SCIENTIFIC PROGRESS.

Sea Telegrams.

The desirability of securing telegraphic communications with floating vessels moored at sea on dangerous parts of the coast has long been under the consideration of the British light-house authorities, but the difficulties opposing a successful solution of the problem proved so great that little, if anything, was done until within a short time ago.

The great difficulty has been to secure the telegraphic connection on board the ship, as the light vessels are moored at the bow by a chain cable 1½ inches in diameter; this chain in bad weather is payed out sufficiently to allow them to ride and swing freely. Sometimes the motion is so great that the vessels describe repeated circles. Any wire connection of an ordinary character would become so inextricable as to be totally useless. The connection would also require to be payed out whenever the mooring chains were payed out. Fouling with the ship's anchors was also another difficulty to be overcome.

The problem, according to an English paper, was ultimately placed in the hands of the British Telegraph Construction and Maintenance Company, and a contract was entered into whereby they were to electrically connect a light vessel with the shore and maintain such communication for one year, no payment being made in the event of any failure to comply with such condition, unless the failure should arise during the working of the cable from exceptional causes for which the contractors could not fairly be held responsible.

The company, after a variety of experiments, have adopted a hollow steel wire rope, 8½ inches in circumference, formed by 14 twisted strands, to be used as a substitute for the chain mooring. The cable runs through the center of this wire rope. On board the light-ship a Morse transmitter, a Wheatstone A B C and a telephone have been fixed. The light-vessel is moored in 10 fathoms at low water, and is about nine miles off the shore. The importance of establishing direct communication with the light-ships cannot be too highly valued, as they frequently see ships in danger several hours before the fact has been known on land.

No doubt if this experimental departure in a new direction be successful, all other light ships round the coast will be electrically connected with the shore, and there seems no reason why all lighthouses should not also be in telegraphic communication with the main wires of the country.

Auroras.

Various speculations are met with from time to time as to the extent of any individual display of an aurora. A prominent French writer has recently attempted to show that auroras are not widely extended, and has instanced the case of the most brilliant aurora of modern times at Brussels, Belgium. This phenomenon occurred on Feb. 4, 1872, and the writer emphasizes the fact that it was not seen at Godthaab, Greenland. Meteorological observations at the latter place for this date are not accessible, but there is little doubt that, if there were such, it would be found that the sky was clouded, thus preventing the appearance. At all events, the observations made on the American polar steamer *Polaris*, which wintered about 400 miles north of Godthaab, show the most brilliant aurora of the winter on Feb. 4th. The same aurora was seen throughout the northern United States.

When we consider that, as shown by Professor Loomis, during a maximum period of sun-spots there are also the greatest number of auroras, and that great solar outbursts are followed or accompanied by magnetic storms and brilliant auroral phenomena, we are led to the view that the cause of the latter may be super-terrestrial, acting either directly or indirectly through induced earth-currents.

It would seem as though all auroras are a manifestation of cosmic energy, and that their extent and brilliancy are limited by the amount of energy, by the vapor in the air, by the temperature, etc. Professor Lemstrom, in Finlaud, obtained a simulation of the aurora by artificial means during one winter; but during the next winter, which was barren of brilliant auroras, both he and Professor Tromholt, the latter in Iceland, failed in this. It may be that the first success was owing as much to earth-currents, or a condensation of atmospheric electricity, as to the artificial means employed.

The question of the source of the electricity of an aurora is an important one in meteorology; and the fact that thus far all attempts at connecting auroral phenomena directly with meteorological have failed, goes far to show a cosmic rather than a terrestrial origin for the aurora.—*Science.*

A PRIZE AWARDED.—The prize offered by the *Societe d'encouragement pour l'industrie nationale*, of £40 for the discovery of "a new alloy useful in the arts," has been awarded to P. Manhes, on account of his discovery of the value of an alloy of copper and manganese for improving the quality of commercial copper. Manhes prepares an alloy of 75 per cent copper, and 25 per cent manganese, and adds it in small quantities to the molten copper after refining and just before casting, stirring the bath of metal at the same time. The manganese of the alloy is stated to immediately combine with the oxygen of the dissolved cuprous oxide, forming a manganiferous slag which is easily removed. The operation is cheap, and very much improves the quality of the copper so treated. Also several of the principal alloys of copper, bronze, gun metal, brass, are of superior quality when prepared with copper purified in this manner, and copper so treated is more slowly acted upon by sea-water.

THE BARTHOLDI STATUE.—At this present writing the Bartholdi statue is daily expected at New York. Some change has been made in the manner of lighting it, which it is thought will add largely to the effect. Instead of having lights streaming from the diadem of the figure, as was at first intended, it is now proposed to have electric lights placed, with strong reflectors, around the foot of the statue, casting a very strong light upon it, and thus giving it the appearance during the night of a shining statue. Then a great vertical beam of light will spring from this uplifted torch, whose light, it is calculated, will strike the lower stratum of clouds, when any are over it, enabling the reflection upon them to be seen far out at sea.

ARTIFICIAL GRAPHITE.—Dr. Aaron has exhibited at the meeting of the Berlin Electrical Society various specimens of vegetable carbon, which made conductors, and rendered almost incombustible by energetic and prolonged heating in a vacuum or in a neutral atmosphere. These properties are so much like those of graphite that the product may well be called artificial graphite, although it is not crystalline. The experiments show that if, as has been affirmed, the presence of hydrogen in graphite determines its combustibility, this can be true only of combined hydrogen, for carbon which has been calcined and made incandescent in an atmosphere of hydrogen is no more combustible than before.

NERVOUS SYSTEM OF SPONGES.—Dr. R. Von Lendenfeld has been studying the sponges of the Australian shores for the Linnean Society of New South Wales, has succeeded in discovering the nervous system of these low animals, which has hitherto escaped observation. This discovery is of very great scientific interest, inasmuch as it proves the much disputed animal nature of sponges beyond all doubt. The nervous system consists of small moidermal, spindle-shaped cells, similar to those ectodermal elements which perform the functions of sensitive cells in jellyfish and other higher animals. Ganglia cells have also been detected similar to those in higher animals.

PEACE OR WAR.—There are those who have, no doubt at least, an unspoken desire to see the two great nations which have stood at swords points so long, actually engage in a bloody conflict that gain might thereby come to some one. But the fact should be recognized that it is an immutable law of nature that no man shall benefit by the calamities of another man; and the law is as applicable to nations and communities as to individuals. The highest interests of civilization and progress, moral and material, are all identified with the maintenance of peace and good-will among the nations.

A CURIOUS FACT.—It is a curious fact connected with deep mining that from the hours of 12 at night till 3 in the morning, the disturbing influences in the bowels of the earth obtain increased activity. At this time it is observed by miners that water falls from places where none is observable during the day. The volume in the water-wheel is perceptibly increased, the atmosphere is charged with gases, which often prevent the lights from burning, and small particles of earth and rock are observed to fall from the tops of the drivers.

A NEW FORM OF ELECTRIC WIRE.—A firm in Glasgow, Scotland, is now manufacturing ribbon wire for electric purposes. It is nearly rectangular in section, and thus can be wound into a smaller space than round wire, while its greater flexibility renders it far more easy to manipulate. It is marked with the same numbers as the corresponding sizes of round wire, and is delivered on wooden bobbins.

THE HEALING POWER OF EARTHQUAKES.—The healing power of earthquakes is a subject for discussion in the Spanish medical press. The statement is made that in the recent shake-up at Malaga most of the patients forgot their diseases and took to the open air. The change agreed with them so well that only a few returned to the hospital.

A PREHISTORIC WORKSHOP.—A French archæologist, M. Saillard, has discovered the workshop of a prehistoric armorer in a steep rock on the coast of Britany. The workman lived in a stone age, and his skeleton was found among the various stone weapons and implements upon which he had been working.

GALLIUM has, for the first time, been isolated, says the Chemiker Zeitung, by an industrial procedure by Dr. L. Ehrlig. The melting point of gallium is 30.5 degrees C., and the globules in which it was obtained had a luster greater than that of mercury.

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A. T. DEWEY. W. B. EWER. G. H. STRONG

SAN FRANCISCO:
Saturday Morning, June 6, 1885.

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Passing Events.

There is little news of an exciting nature from the mining regions, everything going on about as usual at this season. Work is being prosecuted vigorously at most of the camps.

There is a tendency apparent to extend the leasing system. The miuers who are working under this plan seem to prefer it to working for wages, and it has of late come into vogue in many camps on the coast.

Prospectors are now out in all directions in the mountains busily engaged in their summer's work. There are more men prospecting in this State this year than has been the case for a long time. Gold mines are looking up, which is one of the reasons for this.

The Indians are causing trouble again in Arizona and the military powers are once more called upon to take charge of the Indiaus, after the Indian Bureau has brought about trouble.

The immense funeral of Victor Hugo in Paris this week, where over a milliou persons were in attendance, is an evidence of the esteem in which this brilliant poet, novelist and patriot was held by the people among whom he lived. It shows too that a man in Europe may rise to a position above that of kings. No monarch ever had such a funeral or occasioned such general regret at his death.

Shasta Mines.

We give in another column the first of a series of letters from our traveling representative, Frank W. Smith, from the northern counties of this State. The proper mention of the districts of Shasta county cannot he made in one or two issues of the PRESS, hence this is hut one of the series of the letters on the mineral resources of Shasta county, and the other northern counties will also receive due attention.

The newcomer to Shasta learns first of the virtues of the mining camps and districts along the line of the Oregon division of the Central Pacific Railroad about and above the thriving town of Redding, 236 miles distance from San Francisco. This town is the metropolis of Shasta county, and is so situated as to supply a large agricultural as well as a big mining district with the luxuries and necessities of the surrouudiugs. Adjacent to the line of the railroad and the serpentine windings of the crystal waters of the Sacramento (the stream isn't colored up there) is a large number of mining districts, most of which are tributary to Redding. As a natural consequence the new arrival—unless he be a subscriher to the MINING AND SCIENTIFIC PRESS—learns only of these districts to start on.

It has only beeu within the past year that capital and mining men have taken the trouole to iuvestigate the claims of Shasta, and the investments in her mines and the output realized hy these iuvestments speak in glowing and forcible terms of her richness in mineral. It seems strange that mining men should have overlooked this rich field so long and sought inaccessihle and remote places nroverhial for their lack of advantages and in most instances a laok of mineral in paying quautities. Our representative fiuds Shasta county's greatest drawhack, at present, to hecoming a great producing county to he her many advantages in climate, supplies and mineral. Prospectors, of course, find and locate the mines. As a rule, locations are made for what they are worth, and the prospector tries to sell it for what *he thinks* it's worth. The natural advantages enahle the prospector to live so cheap, and he has so many surrouudings of great value to a mine to hoast of that he is so exorhitant in his price that capital is compelled to await the cooling of his imagination and a reduction of his figures to a husiness basis. Mr. Smith saye that capital is gaining a foothold in the county, slowly hut surely, and the extensive development of mines in nearly every district shows mining men of means are alive to the mineral wealth of the county.

Entering Vitiated Mines.

It is etrange that so little is done to secure the safety of men who venture into the atmosphere of an exploded, or otherwise vitiated mine, to secure comrades from imminent danger, or to recover the bodies of the dead. The fault seems rather to lie with the men themselves who undertake these hazardous duties than with inventore. Every now and then we hear of trials of apparatus for enahling the wearer to hreathe freely and with safety in an irrespirahle atmosphere; and in most cases the results are described as successful and satisfactory. The highly scientific invention of Mr. Fleuss appears to he singularly well adapted for the purpose. But though the experiments are successful we very rarely hear of the apparatus in actual use. The reason is probahly that it is not on the spot when it is most needed. Unless large mince are provided with such an apparatus they cannot he ready to afford assistance when needed. It will hardly he contended that the need for such means of security is small. How often are the lives of brave men sacrificed in the attempts to penetrate into the center of an exploded coal mine. No doubt the courage of the man who voluntarily exposes himself to these risks is of the highest order, and even if he lacks prudence, his employers ought to do their share hy having apparatus to prevent danger. If a suitable apparatus were at hand whereby the hreathing was sufficiently provided for, they could at once advance to the points where their attention or aid is required. As it is, conjecture has to supply the place of knowledge. Truly there is yet hut little science in the miue. There is little practical utility in apparatus having tuhing connected to a distant source of air. The explorer must be free of each impediments and risks. A necessary part, or accompaniment, of any hreathing apparatus must he a portahle electric lamp. But this, in the present state of electrical knowledge, is a provision easily made.

Mining Reservoirs and Ditches in California.

The cost of huilding the immense storage reservoirs for collecting water for hydraulic mining in this State was very great, and most of these reservoirs are now useless, owing to the stoppage of hydraulic mining. Aside from the cost of construction, the cost of maintaining the ditches and canals is an important item. It embraces the cost of supervision, repairs, watchmen, etc. It costs the Milton $40,000 and the Bloomfield $30,000 a year to keep their ditches in effective condition. The cost of the Milton is 6.10 cents per inch; on the Bloomfield, 2.27 cents per inch. These ditches cost originally $7,000 to $10,000 per mile. The various reservoirs supplying these mines during the dry season have an impounding capacity of about 5,000,000,000 cubic feet of water. They are situated at elevations of from 5,000 to 7,000 feet above sea level. These two mines employed 400 white miners, at $2.50 to $3 per day, and dishursed yearly in the immediate neighborhood of the mines over $300,000.

The ditches of the Milton Company, 84 miles long, cost $462,698; its reservoirs $214,000. The whole property cost $2,000,000. The North Bloomfield property has cost $2,500,000, of which its reservoirs cost $246,707, and its ditches $466,768.

Mr. W. A. Skidmore, secretary of the Miners' Association, has compiled a table which shows the storage capacity of the miuing reservoirs of this State to be approximately as follows:

	cubic feet
North Bloomfield Co.'s reservoirs hold	1,050,000,000
Milton (now broken)	650,000,000
Eureka Lake and Yuba Canal Co.'s (consolidated)	1,130,000,000
South Yuba Water Co.	1,800,000,000
Omega and Blue Tent M. Co.	300,000,000
Spring Valley G. M. Co.	300,000,000
California Water Co.	600,000,000
El Dorado Co.	1,070,000,000
Small reservoirs on Feather, Yuba and Bear rivers	700,000,000
Estimates of reservoirs in Amador and Calaveras counties	400,000,000
Total	8,000,000,000

According to the official reports of the Surveyor-General of California there are in the State 575 mining ditches, aggregating 4,992 miles in length. This would include many branch ditches of the large companies, which are not embraced in the followiug tahle compiled from the State Mineralogist's report, which is suhmitted with some alteration and correction by Mr. W. A. Skidmore:

Name.	County.	Character.	Length. Miles.	Capacity. Miner's inch.	Cost.
Auburn and Bear River Canal	Placer	Mining and Irrigating	75	3,000	$360,000
Amador Canal Company	Amador	do.	65	2,000	420,000
Blue Tent	Nevada	Mining	32	2,000	180,000
Blanket City	Sierra	do.	17	2,000	90,000
Cherokee and Spring Valley	Butte	do.	50	2,000	125,000
Chapman's Ditch Flat	Placer	do.	50	2,000	125,000
California Water Company	El Dorado	Mining and Irrigating	125	4,500	560,000
Barhanelles Company	Placer	do.	177	3,000	125,000
Eureka Lake and Yuba Canal	Nevada	do.	163	5,800	728,313
Excelsior, Smartsville	Yuba	Mining and Irrigating	110	3,000	1,000,000
El Dorado Canal	El Dorado	do.	26	5,000	650,000
Gold Run Ditch	Placer	do.	26	4,500	150,000
Iowa Hill Company	Placer	do.	27	4,500	175,000
Hendricks Company	Butte	Mining and Irrigating	45	2,000	163,150
Little York and Liberty Hill	Placer	do.	35	3,500	130,000
Milton Company	Calaveras	Mining and Irrigating	100	3,000	500,000
Nokelumne Hill and Campo Seco	Nevada	do.	35	3,200	160,000
North Bloomfield Company	Nevada	Mining and Irrigating	16	3,500	3,500,000
Phœnix Ditch Company	Sacramento	do.	100	4,000	1,000,000
Power's Ditch	Butte	do.	30	2,000	850,000
South Yuba Canal	Nevada & Placer	Mining	123	7,000	800,000
Tuolumne Water Company	Tuolumne	do.	75	3,000	1,500,000
Union Water Company	Sierra	do.	50	1,500	350,000

WEAVERVILLE has built a splendid trail to the New River mines, has it paid for and a cash balauce on hand.

Local Notes.

BIDS for the construction of a new boiler for the steamer *Manzanita* were opened this week by Lighthouse Inspector Phillips and were found to he as follows: Mare Island Navy Yard, $15,370.95; Fulton Iron Works, $8,900; Keystone Boiler Works, $14,000; Union Iron Works, $13.770; Moynihan & Aitken, $7,400; Risdon Iron Works, $12,700. The hids will he forwarded to Washington to be awarded hy the Lighthouse Board.

A FORCE of men is extending the Spear street car track, from the present terminus at Hathaway's wharf to the Oregon dock. In course of time it will he further extended along the water front to the Pacific Mail dock.

THERE are in the vaults of the Mint and Sub-Treasury in this city a surplus of 61,000,000 standard dollars. The supply has for sometime exceeded the demand. The Director of the Mint in Washington decided to reduce the monthly product in San Francisco from 500,000 to 100,000. In consequence of this reduction, and not for political reasons, 41 employes have been discharged.

THE Union Iron Works, having the contract for raising the capsized and sunken ship "Earl of Dalhousie," will soon have her up. They have closed up all orifices and pumped air into the hold. She was lifted 10 feet, and it was found that her anchors aud chains kept the how dowu. A scow was taken over the how, pumped full of water, and then pumped out, so that in lifting it would take, by means of chaius passed under the vessel's how, the weight of the forward part of the vessel. When the ship partly floats she will be towed on to the mud flats near the works and there righted.

THE explosion of the hoiling vats at the tripe factory, South San Francisco, last week, killed one man and seriously wounded several others. A committee from the Stationary Engineers' Association visited the scene of the accident, and it was fouud that the vat whioh exploded was 11 feet long and 72 inches in diameter, while the plate was originally hut one-quarter of an inch in thickness. Thie, owing to long use, had been worn away, until at one spot where it was measured it had a thickness of but one-sixteenth of an inch. There was no steam-gauge or safety-valve connected with the receiver which conveyed the steam from the vat, and it was possible, and highly prohahle, that the vat at the time of the accident held the same amount of steam as did the hoiler—150 pounds. There heing no way to measure the steam in the vat it was left to the man at the hoiler to guess at the quantity it contained. The committee is of the opinion that the vat which exploded and those still in usc at the factory are unsafe with 60 pounds of eteam; that the receivere connected with them should he provided with gauges and safety-valves, and that the best precaution against the repetition of the accident would be the immediate employment of a man underetanding his husiness to take charge of hoiler and vats.

Potassium Bichromate.

This important chemical salt, owing to the discovery of extensive chrome-iron deposits in Maryland, was one of the first manufactured in this country. From this source the greater part of the chrome ores were obtained for domestic manufacture until the discovery of ore in California, where since 1869 many deposits have heen discovered and worked. Ore occure also in the Sierra Nevada range, hut transportation costs too much to admit of its utilization. Orc has been shipped from San Luis Ohispo, Placer and Del Norte counties. It also occure in Napa and Sonoma counties. We produce here about 3,000 tons a year, which is shipped to Baltimore.

The gencral results of over 100 analysee of ore found in this State may he given as follows:

	Per Cent of Chromic Oxide.
Del Norte County	39 to 45
Napa	42 to 46
Placer	35 to 55
Tuolumne	44 to 45.
San Luis Obispo	38 to 60
El Dorado	20

The production of bichromate in the United States during the census year (1880) was 4,000,000 pounds, valued at $520,000. The uses of potassium hichromate are various, but are mainly in the manufacture of chrome pigments printing, dyeiug, charging electric batteries and in tauning leather.

Shaft Sinking.

(*Continued from page 361.*)

where they were made, and there were anti-friction buttons of hard steel in the steps. They were six in number, arranged as shown in Fig. 1, in two sets of three each; but for the greatest part of the time only four were used, in two sets of two each. The nuts of each set were fixed into a timber 14 inches square on the end (D, Fig. 1), and this was held down against the thrust of the screws by four rods (E, Fig. 1) of round iron, one and a half inches in diameter, which passed through it and a similar timber (F, Fig. 1) placed under the main shaft head timbers; the rods having nuts at both ends, and cast-iron washers a foot square, between the nuts and the surface of the timbers. The shaft-head timbers bore the weight of the hoisting frame, and part of the building, and a load of gravel and clay, which was increased from time to time, as became necessary.

One or more hydraulic presses, given by the engine, would do the work much better, and at much less expense than these screws. The pressure could then be kept even and constant while the excavation was going on.

The excavating was almost wholly done by a drill-pump itself loosened the ground, broke up the boulders when too large to pass through the valve, and raised the material efficiently.

The auger stem (H, Fig. 1 and Fig. 5), jars (I, Fig. 1 and Fig. 6), sinker-bar (J, Fig. 1 and Fig. 7), rope-socket (K, Fig. 1 and Fig. 8), temper-screw and clamp (L, Fig. 1 and Fig. 9), and wrenches (Fig. 11) were the same as are used in the oil regions of Pennsylvania, where the tools were made, except the auger, stem and sinker-bar were made shorter, and the necessary weight was secured by increased diameter, because the distance between the sheave (M, Fig. 1) was too short for tools of ordinary length.

The drill-pump could not have a diameter near that of the shaft, like the sand-pumps of artesian wells, nor could it extend (like the drills used in artesian well-boring, and in the Kind-Chaudron process) across the shaft, so as to be brought to bear on the whole area of the bottom by being turned around. It was therefore hung from a movable point, so that its position could be shifted, and it could be placed over and dropped on to any part of the bottom of the shaft. This could hardly be accomplished with the walking-beam ordinarily in use in artesian well-boring; and the drill-rope, therefore, instead of being suspended from such a beam, was connected through the clamp and temper-screw with another rope (N, Fig. 1), which was attached by a loose wooden eye (O, Fig 1) to the wrist-pin of the gear-wheel through which the drilling motion was imparted to the tools. Such a connecting rope is in common use in sinking small artesian wells by horse-power, but it passes over a sheave fixed in position.

[*To be concluded.*]

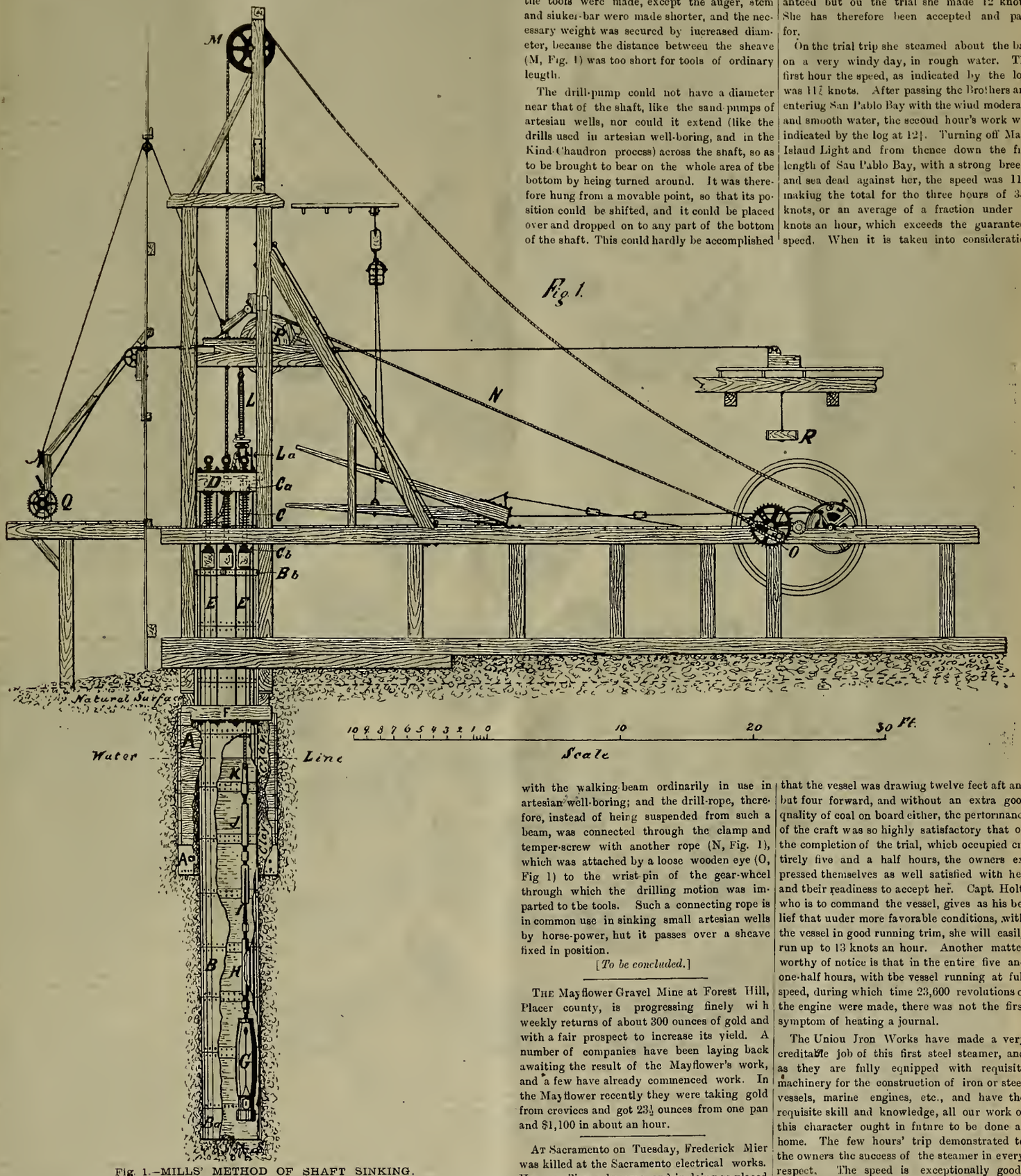


Fig. 1.—MILLS' METHOD OF SHAFT SINKING.

modification of the sand-pump used in sinking artesian wells, which I will call the drill-pump.

It is shown at G, Fig. 1, and in Figs. 2, 3, 4. It it essentially a cylinder or barrel, with an annular drill at its lower edge, and a valve seated just above. It will be more fully described below. The flat drill shown in Fig. 10, was made to be used in ground too hard for the drill pump, and to break up large boulders, and was tried for these purposes a few times, but to little or no perceptible advantage. The

THE Mayflower Gravel Mine at Forest Hill, Placer county, is progressing finely with weekly returns of about 300 ounces of gold and with a fair prospect to increase its yield. A number of companies have been laying back awaiting the result of the Mayflower's work, and a few have already commenced work. In the Mayflower recently they were taking gold from crevices and got 23½ ounces from one pan and $1,100 in about an hour.

AT Sacramento on Tuesday, Frederick Mier was killed at the Sacramento electrical works. He was oiling a dynamo, and in doing so placed his right foot upon a bolt that went into the concrete floor. When the oil can struck the dynamo it formed a connection which gave him such a shock that he was instantly killed.

JAMES R. HARDENBERGH, formerly Surveyor-General of this State, died at Oakland on the 30th ult. He has been statistician in the mint in this city for some time, and has been collecting material for the report of the Director on the subject of the mining interests of California.

A California Steel Steamship.

A short time since we gave a description of the launch of the first steel vessel ever built on the Pacific Coast, which was constructed by the Union Iron Works at their new shipyard at Potrero. The steamer, the Arago, has been completed and her trial trip was made on Saturday. A speed of 10 knots was guaranteed but on the trial she made 12 knots. She has therefore been accepted and paid for.

On the trial trip she steamed about the bay on a very windy day, in rough water. The first hour the speed, as indicated by the log, was 11¾ knots. After passing the Brothers and entering San Pablo Bay with the wind moderate and smooth water, the second hour's work was indicated by the log at 12½. Turning off Mare Island Light and from thence down the full length of San Pablo Bay, with a strong breeze and sea dead against her, the speed was 11¾, making the total for the three hours of 35¾ knots, or an average of a fraction under 12 knots an hour, which exceeds the guaranteed speed. When it is taken into consideration that the vessel was drawing twelve feet aft and but four forward, and without an extra good quality of coal on board either, the performance of the craft was so highly satisfactory that on the completion of the trial, which occupied entirely five and a half hours, the owners expressed themselves as well satisfied with her and their readiness to accept her. Capt. Holt, who is to command the vessel, gives as his belief that under more favorable conditions, with the vessel in good running trim, she will easily run up to 13 knots an hour. Another matter worthy of notice is that in the entire five and one-half hours, with the vessel running at full speed, during which time 23,600 revolutions of the engine were made, there was not the first symptom of heating a journal.

The Union Iron Works have made a very creditable job of this first steel steamer, and as they are fully equipped with requisite machinery for the construction of iron or steel vessels, marine engines, etc., and have the requisite skill and knowledge, all our work of this character ought in future to be done at home. The few hours' trip demonstrated to the owners the success of the steamer in every respect. The speed is exceptionally good, when it is considered that the vessel is built for a coal carrier.

The Arago is 207 feet long over all, 200 feet water-line, 30 feet beam, 16 feet hold, and of 750 tons register. The engines are direct-acting inverted cylinder surface-condensers, with cylinders respectively 24 and 48 inches, 38-inch stroke. The propeller is 10 feet in diameter. The boiler is 16 feet long, 8 feet 6 inches wide, 15 feet high, and designed for 100 pounds pressure.

Reduction Works Needed in Nevada.

What is needed in various sections of Nevada, says the Eureka *Sentinel*, in order to foster and build up the mining industry, is reduction works. The cry goes up from miners of limited means all over the State that while they have ore which would work $20, $40 and even $80 a ton they have no means whereby to get it reduced nor are they able to dispose of it, unless they ship it at great trouble and expense to some point probably 200 or 300 miles distant. In as much as we have here in Eureka two of the best furnaces on the Coast, we have no reason to complain, but were it not for these furnaces Eureka county would certainly not enjoy even the limited prosperity that it does to-day. Very frequently miners while prospecting strike pockets of ore which will work upward of $100 a ton, and from which they mine probably two, three and five tons. Knowing that it is salable at a fair price in town they ship the same in and at once get in return sufficient coin to allow them to continue on with their work, searching for the greater wealth they believe their properties contain. They dispose of their ore somewhat on the same principle as the rancher does his grain, vegetables, etc. The same opportunity is just what is needed by the miners about Reno, Winnemucca, Wells and points south of Eureka county. Whether the lack of these needed reduction works is the fault of the men seeking good investments or the miners we are not prepared to say, but certainly if the latter can show to the former that the establishing of such works at the places mentioned would prove paying propositions, there is no doubt but that they would be soon forthcoming. Practical men of means want to see how they are going to get their money back and also make a profit before investing.

In the immediate neighborhood of Pioche it is said there are a number of mines that have exposed in them large bodies of ore. The character of the ores is varied. Some are free-milling and others rebellious and hard to work.. To our knowledge there is but one small mill in that locality, and that has but five stamps to crush the free-milling article. Why it is that a plant could not be established there that would receive and work all characters of ore, and prove a profitable investment we are at a loss to understand. If any one seeking such an investment would give that section a visit, we feel confident they would see enough ore there to keep them busy for sometime. The Pioche *Record* of last Saturday speaking of the need says: "This part of the country is in need of reduction works. Works that can work ore that assays from $30 and upward. There are large quantities of this ore along the range, but as there are no works for its reduction it is of no account. The $60 ore is not worth extracting, for the miner can get nothing for it. The buyers cannot afford to purchase it and ship it to Salt Lake for reduction. They can afford to purchase none but ore of high grade. Reduction works for the working of low-grade ore, located down about the Eight-mile House, that would deal fairly with the miners, would yield an immense profit to its owners. The mines along the range, from Stampede to Bristol Divide, would be worked and the reduction works kept busy, but at the present state of affairs men are unable to get anything for ore that samples less than $100. If it be true it pays to work $12 ore or less in Colorado, we know no reason why from $30 to $60 ore should not pay in Nevada. There is a large field here for a company to operate in that erects reduction works for the working of low-grade ore."

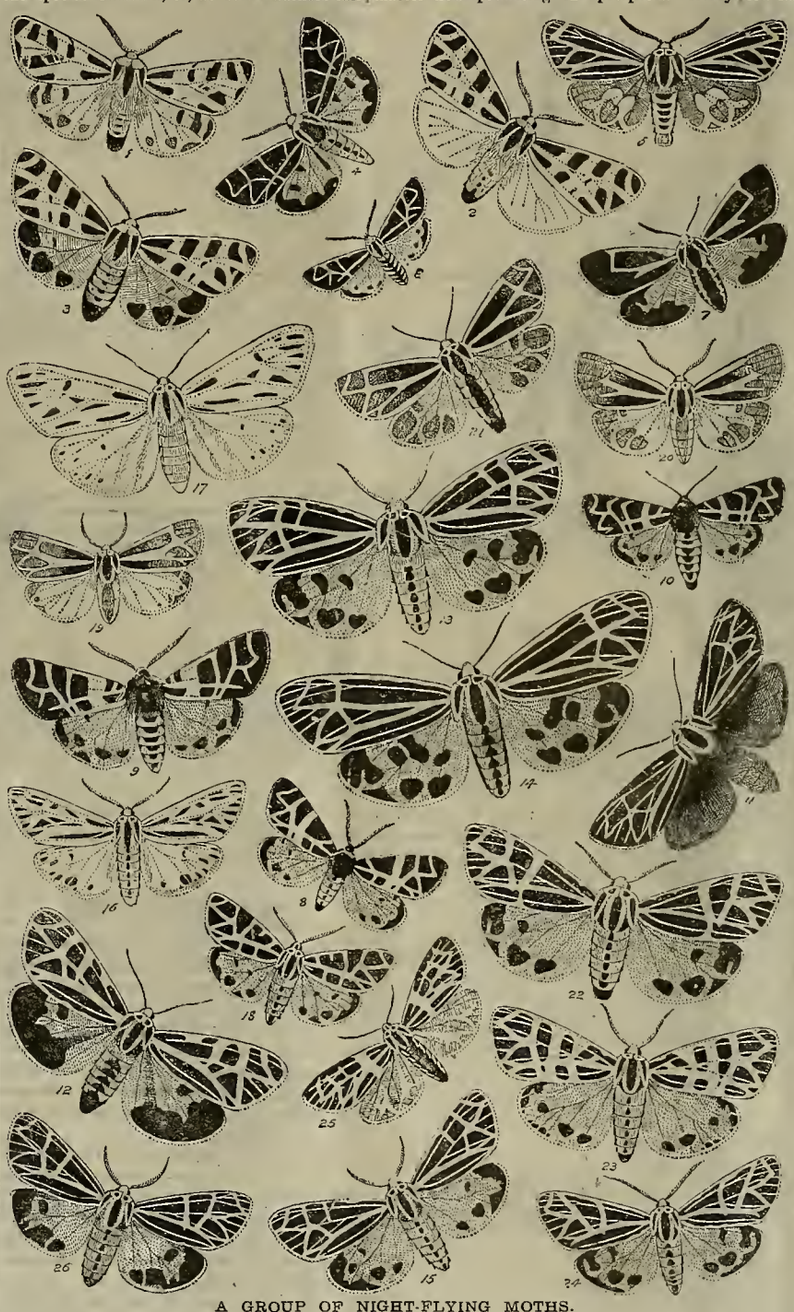
SHASTA COUNTY MINES.—While the mining outlook of this county is favorable, it must be said that "honanzas" are not as plentiful as office-seekers in Washington. That we have many permanent and lasting ledges has been fully demonstrated, and that many more will be demonstrated, there is no doubt. Men of science, who can give the most plausible theories as to nature's method of procedure in building up gold-bearing veins, are just as much at sea in determining a likely spot to find a paying gold mine, as the ordinary miner who has nothing but practical common sense to guide him in the search. It is more than probable that nature, in the formation of quartz ledges and gold channels, has proceeded, as in all her operations, in accordance with fixed and immutable laws; but the knowledge of her secret processes, as far as it would enable man to tell the exact spot where mineral wealth is hidden, she obstinately refuses to divulge. To lift gold mining from this condition of uncertainty, would only dethrone that metal from the royal position which it has so long held.

As an available field for the investment of capital in this industry, Shasta county does not pretend to hold out the certainty of the investment proving remunerative. Mining is a lottery here as elsewhere, with perhaps more blanks than prizes in the long run. We do claim, however, that there is no mineral section in this State that holds out a better hope of satisfactory returns than this county; and there is certainly no country where the natural and climatic surroundings are more favorable for mining. For the capital expended here, we believe the returns have been fully satisfactory as any gold region can boast. This fact is gradually being appreciated, and capital is slowly but surely moving this way.

A Group of Moths.

We can hardly give an engraving more suggestive of the season, the opening of summer, than the group of moths which appears on this page. The air is alive with them. Their darting about is very forcibly brought to the attention of one who strolls out during the evening hours, and their hunting against the window pane or fluttering about the lamp, makes the indoor population well aware of their presence. There is every reason to expect an unusually large crop of moths this year. Such a thing always occurs during the summer after a warm, dry winter like the last.

The engraving will serve to show how various are the forms even within a single species, and when one extends his view so as to take in genera and families, of course the variety extends almost without limit. The moths shown in the engraving are all of California varieties of the species *Chelonia*, or, as some authors call



A GROUP OF NIGHT-FLYING MOTHS.

them, *Arctia*. They are very showy, and some forms quite rare. The species are nocturnal in their habits, but sometimes they fly by day, especially the females. The caterpillars, which are the larval state of the insect, are all hairy, are not considered injurious to vegetation, that is, are not counted among the pests.

The engraving, although it will serve well enough to give a popular idea of the variety of forms of the species, is not accurate enough to serve as an entomologist's ideal representation. Mr. R. H. Stretch, of this city, has made a special study of this species and is the recognized authority. His drawings, engraved by a more delicate process, serve as standards for the identification of the varieties. He has taken upon himself the very difficult task of drawing the lines where the species begin and varieties end, and as the reader may imagine from the similarity and diversity of the few shown on this page, is becomea an undertaking of much labor and exactness. The reward is in the consciousness of well doing as it is in so many undertakings of exact science.

Idle Mines and Idle Capital.

The San Miguel *Journal* says: Never in years has there been as much idle capital as at present, and we predict that before the season closes it will turn to mining. This is all we need to bring us out. Owners of mines do not, as a rule, exert themselves to develop a country, and individual effort in most cases, unless liberally supported by capital, is powerless to open up mines extensively. Unless discoveries are unusually large and valuable the product falls short of the cost. Unless shafts are sunk sufficiently deep little or no drifting can be done, and consequently no profits can be realized. When deep shafts have been sunk primitive appliances are unavailable, and steam and other powerful machinery must be provided. Penniless men cannot supply these requisites, and unless capital steps in work must of necessity be abandoned, no matter how promising the prospects. Every mining district supplies numbers of valuable lodes lying idle and unproductive awaiting those who have money to make them profitable. This is the reason why so many mines and prospects are offered for sale. The system of leasing shafts and tunnels temporarily abandoned is bringing many new producers into the market annually. For example, a company of two or three practical miners tired of working for wages, having examined certain prospects and believing that a small amount of work will put them in pay, get a few drills, some powder and fuse and begin. In many cases their hopes are realized, and in each case a new mine offers its ore for sale. Very much of the development accomplished the past few years is attributed to this cause. Again, little syndicates of local capitalists are employing miners to open new mines. There is no great hazard in these undertakings. The cost is light and if pay is found the rewards are great. It is upon these and similar means the State is dependent for a constantly increasing supply of mines for production or sale. It will be carried on intermediately because the field is illimitable. It is a commendable enterprise, for nothing is more profitable. As the demand for good mines will continue henceforth, miners will always have all they can do to keep up the supply.

The New Smelting Works at Eureka.

Twenty years ago the smelting of argentiferous lead ores was an unknown industry west of the Mississippi river, and when the first attempts were made—notwithstanding they were made by persons familiar with the methods of smelting current in Europe—most of them proved, for a combination of reasons, utter failures. Eureka has figured in no small way as a school for the industry, inasmuch as many points have been gained by those making a study of the business from the successes and improvements achieved in it, and also by the few failures suffered since the inception of the first plant here in 1868. One writer of prominence, speaking of the industry in America, says: "It is true, Eureka, Nev., has been, so to speak, the cradle of the art of smelting in the West."

The first smelter established in Eureka that proved a success was constructed in 1869 by Mr. G. Collier Robbins, father of superintendent Frank Robbins, of the Eureka Con. Co. The knowledge and adaptability to the business appears to have been transmitted from the father to the son, for the manner in which the Eureka Con's new plant has been established would indeed be credit to one of greater years and experience than supt. Robbins.

A reporter of the *Sentinel* called yesterday at the new works, and with a large number of other visitors was shown through the plant. Everything was working as smoothly as clockwork, and were it not for the new appearance of everything one unacquainted with the situation would suppose that the works had been running for a year or longer. Slag ran off into pots, and bullion appeared as though it was nothing unusual. The new water-jacket furnace, instead of being a parallelogram in shape, as is commonly the case, is, so to speak, two long parallel sides joined at their extremities by semi-circles. It is a combination of the Rachette and Piltz furnaces. As regards its size and capacity the following figures may prove of interest:

	Inches.
Length inside jackets	81
Width inside jackets	40
Hight of jackets	42
Hight of furnace from bottom of crucible to feed floor	210
Number of tuyeres	9

Smelting capacity, 60 to 70 tons.

The water-jacket opens on top to admit of the extraction of the scale formed from the carbonate of lime in the water. A novelty in Nevada in such works is the manner adopted by Mr. Robbins and the foreman of the plant, Mr. W. J. Stevens, (who is entitled to considerable of the credit due), of drawing off the smoke, dust and fumes, these being carried away by the flue below the feed-floor instead of above it, as in the old style furnaces. The furnace is cut off at the feed-floor, and is fed through an iron box of the same shape. No smoke whatever is to be seen on the feed-floor. All ores are thoroughly analyzed and mixed in beds of 600 tons ready for smelting, and the same is delivered at the furnace by a self-dumping skip. A number of other improvements will be added to the new plant, and especially about the furnace shortly, and the chief reason for the furnace being started before all these auxiliaries were completed, was on account of space being required for the reception of ore, there being something like 3,000 tons about the works, and to continue to add to that quantity would require extra handling, and consequently unnecessary expense.—*Eureka Sentinel.*

THE NEW IDAHO GOLD BELT.—The *Wood River Times* says: Mr. Stanley, the expert sent here by U. S. Senator Jones and ex-Congressman Davis, of California, visited the head of Rock and Camp creeks yesterday. He was very favorably impressed, and says there is undoubtedly quantity, but as to quality he cannot say until he shall have made thorough tests of the samples which he takes with him. The vein can be traced on the surface for miles, is of great width, between porphyry and granite, and crops out in places for as much as 500 feet in length. Wood and water are abundant, and other working facilities favorable. The gold seems to be free, and the silver found associated with it is an indication of permanency. Now, the questions to be settled are: Will the precious metals be extracted by cheap mill process? Does the vein carry precious metals in paying quantities? The chances are in favor of the district; but as everything else is so favorable it is possible that the two requisites above stated will be lacking. However, the first one or two months' run of the mill will determine.

MORMONS are growing cotton on irrigated land in Southern Nevada.

ENGINEERING NOTES.

THE COST OF THE DISTRIBUTION OF POWER BY ELECTRICITY.—A pamphlet issued by the Safety Electric Power Company, using the Daft system, places the estimate of cost for the plant for the distribution of 500 horse-power, nominal radius of 2½ miles at $85,000, while the daily running expenses are set down at $95. It is assumed that 350 horse-power will be ready for delivery at any moment, and, following the ordinary practice of power producers, at least 600 horse-power can be rented therefrom to small consumers, limiting the delivery to, say, 10 horse-power for any one consumer; in this way an average of $150 per horse power per annum may be realized in New York City, which would therefore return a net income of $55,000 or 65 per cent per annum on prime cost. The plant for a 10-mile section of street-car lines, on the assumption that 50 cars are to be run and that 150 horse-power are ready for delivery on the track at all times, is $62,000. Fifty loaded cars may be moving at the same time. Assuming a run of 16 hours per day per car, the expenses are put at $49 or less than $1 per car, whereas the care and maintenance of 400 horses, which cost originally $50,000, is put at $286.87 per day, or more than $5 per car. Even should the figures be raised in the first case and lowered in the second, the advantages of electricity appear to be very great.

PROGRESS OF THE TEHAUNTEPEC SHIP CANAL RAILWAY.—The Government of Mexico has lately made important additions to the concessions heretofore granted to the Tehauntepec ship railway. Mexico guarantees the net revenue of the company to the extent of $1,250,000 per annum for 15 years after the completion of the road, and gives the company right to ask for additional guarantees from other governments to the extent of $2,500,000 per annum, or a total of $3,750,000, being 4 per cent on $93,000,000.

Other guaranteeing governments may have a rebate of 25 per cent on their commerce for thirty years, and a representation of two-ninths in the Board of Directors. The company has a right to establish coaling stations, and to import coal free of duty, to furnish ships in transit, and also the right to collect all tolls, except those from Mexican commerce, in gold, a difference in favor of the company of about 18 per cent. There are several other minor concessions granted, such as the right to establish two tow-boat lines independent of taxation, and to collect harbor dues.

A NEW SHIP CANAL SCHEME.—The construction of a ship canal from Rochester up the valley of the Beaver river to Lake Erie is being talked of, and will probably be undertaken before very long. The projected canal will pass through Beaver, Lawrence, Mercer, Crawford and Erie counties. There are many advantages to be gained, among them the fact that these counties are rich in deposits of limestone which now is transported to Western Pennsylvania at a cost of 60 cents per ton, and could be taken by water were the canal constructed at a cost of only 10 cents. The advantages to the iron men of the Keystone State are by no means the only ones, or even the most important to be gained by the construction of such a water way.

SAFE LOADS ON IRON COLUMNS.—Navier gives one-fifth of the breaking weight as the safe load of an iron column in practice. Francis, an American engineer, gives the same, while Morin adopts one-sixth as the rule. Iron pillars supporting loads free from vibration, such as water tanks, will safely carry one-fifth their breaking weight. In factories or stores where moderate vibrations occur, the working load should not exceed one-sixth, and if the supports be liable to transverse strains or severe shocks like those on the ground floors of ware-houses, where loaded wagons or heavy packages are apt to strike them, the load should not exceed one-tenth.

TELEGRAPHIC COMMUNICATION AT SEA.—A French officer of engineers has conceived an idea for enabling vessels upon the high seas to communicate with the shore by means of the existing submarine cables. He proposes that these cables shall be supplied at convenient intervals with short branches, the free ends of which shall be buoyed in such a manner that passing vessels, provided with the necessary batteries and with a key by which to obtain access to the wires, may telegraph home. Experiments to test the feasibility of the scheme are about to be begun, and several branches are being attached to the cable which connects Algiers with Marseilles.

AN EXTENSIVE IRRIGATION ENTERPRISE.—A company has been organized in Florence, A. T., with a capital of $10,000,000, for the purpose of constructing a large canal from a point 13 miles east of Florence, and reclaiming all the mesa lands for a distance of 75 miles down the Gila river and from 10 to 20 miles back from it.

VOLCANIC ERUPTIONS AND MINES.—Herr Jall, who has made a special study of volcanic eruptions, advances the theory that explosions in mines usually occur about the same time as earthquakes. He warns the mine-owners of Europe that June 12th, July 12th, September 8th and September 24th are days very likely to prove dangerous.

USEFUL INFORMATION.

HOW TO SPLIT A BANK NOTE.—The remarkable operation of splitting in two the paper on which a bank note was printed was accomplished by a Kentucky counterfeiter. The two sheets made were nearly transparent. He made a plate of copper and brass, a little larger than the bill, and spread one of the sheets on top of it. With a steel tracing pencil of his own manufacture he engraved through the sheet the exact counterpart on the plate. The other half was engraved on another plate in a similar manner, and then he was ready for printing his spurious money. This method of workmanship looks very simple, but it is the first time it had been done by a counterfeiter, as it is said to be almost impossible to split the bill. However true this reported difficulty may be, it is generally an easy matter to split a sheet of paper. Paste a piece of strong cloth to each side of the paper to be split. When dry, violently pull the two pieces asunder, when part of the sheet will be found to have adhered to the one and part to the other. When the paste is softened in water the paper can be removed from the cloth.

BROWNING GREEN BARRELS.—Take spirits of nitre, one pound; alcohol, one pound; corrosive sublimate, one ounce. Mix in a bottle and keep corked. In using it, plug both ends of the barrel and let the plugs stick out four or five inches to serve as handles, and also to prevent the fluid from entering the barrel and causing it to rust. Polish the barrel perfectly, then rub it well with quicklime by means of a cloth, which will also remove all oil or grease. Now apply the browning fluid with a clean, white cloth. Apply one coat and set in a warm, dry place, until a red rust has formed over the whole surface. The time required for this in warm weather is from 10 to 12 hours, and in cold weather from 15 to 20 hours. Then card it down with a gunmaker's card, and rub it off with a clean cloth. Repeat this process until the color suits, as each coat gives a darker shade.

ORIGIN OF CARRIAGES.—The oldest carriages used by the ladies of England were called whirlicotes. These became unfashionable after Ann, the daughter of Charles IV and Queen of Richard II, about the end of the fourteenth century, showed the ladies how gracefully they could ride on a side-saddle. Coaches were first known in England in the year 1530. They were introduced from Germany, by the Earl of Arundel. They came into general use among the nobility in the year 1605. The celebrated Duke of Buckingham was the first who rode in a coach and six horses; to ridicule this pomp, the Earl of Northumberland put eight horses to his carriage. Coaches to hire were first established in London in 1625. There were only twenty of them kept at the principal inns. In the year 1637 there were 50 hackney coaches; in 1654 there were 200; in 1694 they were limited to 700, and in 1755 to 800; there are now 1,100.

STAIN-REMOVING SOAP.—A universal stain-removing soap for use in bleach, print and dye works is thus described in the *Moniteur de la Teinture*. "Take 22 pounds of the best soap and reduce it to thin shavings. Place the soap in a boiler with 88 pounds of water and 13.25 pounds of ox gall. Cover up and allow to remain at rest all night. In the morning heat up gently, and regulate it so that the soap may dissolve without stirring. When the mass is homogenious and flows smoothly, and part of the water has been evaporated, add 0.55 pound of turpentine and 0.44 pound of benzine and mix well. While still in a state of fusion, color with green ultramarine and ammonia, and pour into molds, where it should stand several days before used.

A NEW METAL DRILLING TOOL.—A metal-drilling tool of new form has been patented by T. Scheffler, of Paterson, N. J. The cylindrical head of the tool which carries the drill is surrounded by two half-rings which rest in a groove cast around the head. A cam enters between two of the adjacent edges of the half-rings. A handle made with an eye at one end surrounds the head. This handle is provided with an irregular socket which receives the cam. On moving the handle to the right the cam forces the half-rings apart, so that the latter friction tightly up against the head and force it around. On the reverse motion of the handle no strain is placed on the rings, and they simply revolve loosely with the handle.

GLUE.—The glues generally used have the inconvenience of leaving yellowish traces, which have a disagreeable appearance, especially if the articles to be joined together are transparent. The following process yields a glue, gum or cement which is absolutely colorless. Mix in a stoppered bottle sixty parts of chloroform and seventy-five parts of caoutchouc cut into very small fragments. When it is dissolved and the mixture is quite fluid, add fifteen parts of mastic in tears and let the whole digest for eighty days. The glue thus prepared is used in the way commonly directed for joining glass, porcelain, etc.—*Manufacturers' Gazette.*

A NEW PREPARATION OF WOOD.—A French chemist recently exhibited a piece of wood that shone like, and resembled a metallic mirror, having produced this effect by soaking the wood two or three days in an alkali caustic heated to 164 degrees and 197 degrees. The wood was then placed to soak in another liquid, hydrosulphate of calcium, to which he added after 38 hours a concentrated solution of sulphur. After remaining in this a couple of days, the wood is put into a third bath similar to the first, in which it remained about 50 hours, the bath being heated to 95 degrees and 122 degrees. When thoroughly dry the wood was scraped with tin, zinc, and then with a piece of glass or china, when the wood shown, as remarked above, like a metallic mirror.

STAINING WOOD TO RESEMBLE CEDAR.—As a simple method of imparting to any plain white wood the appearance of cedar-wood, the following process is recommended: Mix two parts of caoutchouc and one part of caustic soda, in one hundred parts of water (all by weight). The article to be stained should be boiled in this solution for some hours, and is then rinsed in clear water and dried. If the desired depth of tone has not been obtained, a second boiling must be resorted to. This stain is said to sink so deep into the wood that even thick sheets of veneer thus treated will be colored right through, while other wood articles thus stained may be safely manipulated without any fear of the original color of the wood showing through.

THE FIRST CLOCK which appeared in Europe was probably that which Eginhard (the secretary of Charlemagne) describes as sent to his royal master by Abdallah, King of Persia: "A horologe of brass, wonderfully constructed, for the course of twelve hours, answered to the hour-glass with as many little brazen balls, which drop down on a sort of balls underneath, and sounded each other." The Venetians had clocks in 872, and sent a specimen of them that year to Constantinople.

CANNED EGGS.—The list of goods canned has been enlarged by a company in St. Louis, which has begun canning eggs. A factory has been erected, and is now in operation, where they will can 1,000,000 dozen annually. The eggs are put through some sort of a process by which the yolks and white are separated from the shells, and the substance is then dried and canned. One teaspoonful is said to be equal to one egg, and it is warranted to keep fresh for three years.

PAPER PLATES.—A landlord in Berlin has introduced paper plates. Bread and butter, cake and similar articles were served on a pretty *papier mache* plate, having a border in relief and resembling porcelain. The landlord liked them because they were so cheap they could be thrown away after once using; waiters liked them for their lightness, and because they were neither to be washed nor broken, and guests were delighted to take them away as souvenirs.

GOOD HEALTH.

The Management of Scarlet Fever.

Scarlet fever is spread by contagion—by the transfer of particles of living matter from a person suffering from the disease. These particles of living matter come from the skin, from the membrane lining of the mouth, nose and throat, and perhaps also from the intestines and urinary organs. It is a disease which it is specially desirable to prevent the occurrence of in young children, partly because the susceptibility to its cause diminishes greatly with increase in age, and partly because it is much less dangerous in adults. There is reason to question the wisdom of using costly and troublesome methods of preventing the spread of measles, because the susceptibility to the cause of this disease remains in adult life, and it is, if anything, more liable to result in dangerous lung complications in advanced age than it is in children; but there can be no doubt as to the wisdom of restricting the spread of scarlet fever as much as possible.

The precautions to be taken when a case occurs in a house are in many respects the same as in a case of diphtheria—namely, to isolate the patient in an airy room having the least possible amount of furniture. The room should have no carpets or curtains, and no upholstered furniture, such as lounges, sofas, stuffed chairs, etc.

All the secretions and excretions, and all articles soiled by them, should be disinfected thoroughly and promptly while they are yet moist. A special and important precaution is to keep the whole surface of the body thoroughly annointed with some bland fatty matter, such as camphorated oil, vaseline, or cosmoline; and especial care should be taken to do this when convalescence has set in and the peeling off of the skin has commenced. All toys, books, etc., handled by the child are dangerous, and had best be destroyed in the room by fire, or by putting them into a vessel containing a strong solution of bichloride of mercury or of chloride of zinc.

No clothing, bedding, towels, or other woven stuffs should be taken from the room while dry; they should be placed in a tub or wash boiler containing scalding hot water, and thoroughly boiled before they are allowed to dry.

When the peeling of the skin has entirely ceased, the patient should be thoroughly bathed—using warm soap and water—be dressed in entirely fresh clothing, and the room and its contents should be thoroughly disinfected. The average period during which complete isolation of the patient is required, and during which he should not go out of his room or receive any visitors, is five weeks. Usually six weeks will be required to secure absolute freedom from danger.

The walls and ceiling of the rooms should be rubbed with damp cloths, which should be at once burned or boiled. The floor and all wood-work should be thoroughly scrubbed with soap and water.

The windows, fireplace, doors and all other outlets of the room should be tightly closed, and sulphur burned in the room in the proportion of one pound of sulphur to each thousand cubic feet—that is, if the room is 15 feet square and 11 feet high, about two and a half or three pounds of roll brimstone will be required. Put the brimstone in an iron kettle and place the kettle on a tray of sand three inches thick, or on a platform of bricks; pour a wineglass of alcohol on the brimstone and set fire to it, leaving the room immediately, as the fumes are dangerous. Let the room remain tightly closed for 24 hours, then open all the windows and the fireplace, and let the fresh air circulate in it for from 24 to 48 hours.—*Exchange.*

HEALING PROPERTIES OF WATER.—There is no remedy of such general application and none so easily attainable as water, and yet nine persons in ten will pass it by in an emergency to seek for something of less efficacy. There are but few cases of illness where water should not occupy the highest place as a remedial agent. A strip of flannel or a napkin folded lengthwise and wrung out of hot water and applied around the neck of a child that has the croup will usually bring relief in ten minutes. A towel folded several times and quickly wrung out of hot water and applied over the seat of the pain in toothache or neuralgia will generally afford prompt relief. This treatment in colic works like magic. We have known cases that have resisted other treatment for hours yield to this in ten minutes. There is nothing that will so promptly cut short a congestion of the lungs, sore throat or rheumatism as hot water when applied promptly and thoroughly. Pieces of cotton-batting dipped in hot water and kept applied to all sores and new cuts, bruises and sprains is the treatment now generally adopted in hospitals. Sprained ankle has been cured in an hour by showering it with hot water, poured from a hight of ten feet. Tepid water acts promptly as an emetic, and hot water taken freely half an hour before bed-time is the best of cathartics in the case of constipation, while it has a most soothing effect on the stomach and bowels. This treatment continued for a few months, with proper attention to diet, will alleviate any case of dyspepsia.

TICKLED TO DEATH.—The degree of annoyance caused by a small object like a hair, a grain of sand or a tiny splinter depends entirely on the location. All are not ticklish or hypersensitive at the same place. Some can be thrown into paroxysms by tickling the feet with a straw, others go into spasms if a feather is drawn under their nose, while others almost take a fit if tickled in the ribs. It is said that the most exquisitely horrible torture practiced during the Inquisition was that of tickling the feet of sensitive heretics. Every nerve in the entire body was set on end and made to dance at a maddening pace. This must have been the refinement of torture, indeed. In order to satisfy your curiosity on this score, have your hands securely tied and your head held firmly, while some one slowly, gently tickles your nose with a feather, or even with a hair. You will soon conclude that death would be preferable to a continuance of the torture. A case of *killing* was recently reported in Europe, where, on trial, it came out that a man had killed three wives. In each case the victims were bound and tickled to death by slight application to their bare feet.

THE ALCOHOLIC DISEASE.—An examination of alcoholic intemperance in its origin can only terminate in one result—that is, in the conviction that it belongs, both physically and morally, to the class of fermentative or zymotic diseases. No mere deprivation of natural appetite will produce it; never does it exhibit itself until alcohol has been consumed; and what is especially to be remarked is, that alcohol acts in the production of the intemperate habit by poisoning the blood and arresting the healthy operation of the nervous system. It attacks the higher faculties; those qualities which give a moral tone, and lead man up to true happiness and a virtuous life. It dethrones reason, and retrogrades its victim to the level of the brute. In this manner, and in no other, the craving for alcoholic drinks is produced—which is always a physical malady in its inception—until by continuous indulgence it takes a settled and chronic form, leading its victim through the stages of *mania a potu, dipsomania, epilepsy,* and numerous forms of mental and physical depravity.—*Quarterly Journal.*

A PECULIAR DEVELOPMENT.—Workmen in the St. Gothard tunnel were affected with a peculiar disease which seemed to be caused by minute worms. The same malady has been observed among brick-makers. From the latest researches it appears that the worms develop in muddy water, which the workmen carelessly drink.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

MAHONEY.—Amador *Ledger*, May 30: At the Mahoney affairs remain about the same as last week. W. A. Nevills went over to Sutter creek last Monday for the purpose of going down the shaft and inspecting the lower levels. The water, however, was several feet deep in the 800-foot level, and of course it was useless to attempt to go down. The mortars for the mill in Hunt's gulch arrived here early this week. All the machinery is now on the ground. The mill is expected to be in running order in less than two weeks. The hoisting works at the Moore mine are being replaced on the old shaft, with new framework where necessary. The shaft on what is called the Limestone lead has been abandoned, the prospect at the bottom not proving sufficiently encouraging to warrant extensive explorations at that point. The building which has been erected at the mouth of the big tunnel at Middle Bar is partly designed for a roasting furnace, which has been a want long felt in treating the rich but rebellious ores met with in that district. The present contract at the Middle Bar tunnel will be completed next week. The tunnel will then be in a distance of over 2,300 feet. It will be necessary to get heavier machinery before the tunnel can be carried much further. It is the intentin, however, to cross-cut at various points before attempting to push the header further.

Butte.

BED OF THE RIVER.—Gridley *Herald*, May 28: After duly prospecting the claim, a number of our citizens have organized a mining company for the purpose of working on the American Bar in Middle Fork of Feather river. They intend to turn the water out of the river into a canal, for a distance of 900 feet, and work the bed of the river. This has been done before, and the old canal is still there, ready for use. Similar operations immediately above and below the claim have, in days gone by, paid big money. Saturday, E. W. Noteware (who is temporary foreman), departed for the claim, with all the necessary machinery and a crew of laborers. An under-shot wheel, fourteen feet in diameter, will be used for pumping the water into the shices, in connection with a twenty-inch pump.

Calaveras.

WEST POINT.—Cor. Calaveras *Chronicle*, May 30: The Russell Furnace and Mining Co. have, after some delay, started up again. They have bought out Camille and Beauchemin in the Lockwood mine; price paid, $5 000. They are sole owners now of the Lockwood and Point mines. The former is in splendid condition, exhibiting a ledge 10 inches in width, which shows gold freely. Old miners estimate that the ore will yield $80 per ton in free gold. Many years prior to the present owners taking hold of the mine, it had been worked and very rich ore extracted from it, but after a certain depth had been attained the pay ore gave out, but sinking was continued until all efforts proved unavailing to regain its former prestige. Subsequently the mine was abandoned. The present parties followed the same tactics with dire results, till some one suggested that it would be a good scheme to crosscut into the footwall. The advice was followed, and the result was favorable in the extreme as a first-class body of ore was uncovered. Its extent as yet has not been ascertained. The Point mine is a property that looks very promising also. The work of repairing and placing additional machinery at the Russell furnace is going on with vigor. A large force of skilled workmen are busily engaged, and the work is being prosecuted with neatness and dispatch. A capacious boarding-house is being erected for the accommodation of those employed at the furnace. Two hundred cords of pine wood have been purchased, and will soon be placed under the shed. The Russell company have about 280 tons of sulphuret ore. The work of reducing the ore will be commenced as soon as the furnace is in working condition, which will be in about ten days. The Simpson furnace is undergoing repairs and improvements, such that will aid to make it a complete success. Simpson & Co. do not own and work mines. Their business is to purchase ore from the miners. They have already bought ore from the following parties: F. Crockett, 17 tons at $35 per ton; A. Keltz, 10 tons at $100 per ton; Sterling & Co., 6 tons, price unknown. Chances are quite favorable that they will purchase the second-class ore from the Lone Star and Reed & Hillary dumps. A sample of 200 pounds was worked from the aforesaid mines which gave a most satisfactory result, however 10 tons will be worked in order to give it a more thorough test. There are over 1,000 tons of the ore. Sinking is being prosecuted in the Keltz mine. The ledge shows as well as ever in the bottom, about 12 inches in width, and will yield $100 per ton. Longitudinal extent of ore body has not been determined as yet as no levels have been run. A rich discovery has been made in the Del Monte claim.

Inyo.

SMALL THINGS.—*Independent*, 30: George Thorpe and Jim Jenkins have been at work for several montbs past prospecting the Indiana claim, near Ceeler. It might appear that their labor was wasted when it is stated that as a result of seven months' work they had secured only eight tons of ore; but that ore is worth over $400 per ton and when all expenses are paid the two men will realize over $100 a month for their work. These men were not subject to any boss, they came and went, worked or played as pleased them, and surely the above figure is very fair wages. There are hundreds of similar small veins of ore in the Inyo mountaids.

Mono.

THE STANDARD MILL.—Bodie *Free Press*, 30: The whistle of the Standard Con. mill—the Old Reliable—echoed loud across the canyon this morning and brought vividly to mind pictures of the prosperous past. President Pettibone states that the ore on hand and that being extracted is sufficient to keep the mill supplied indefinitely. The mill required considerable overhauling and new pipes had to be laid in place of the old ones bursted on account of leaving them in water. The thunder of the stamps will be heard in a few hours.

CON. PACIFIC.—Since last report the drift to cut Pacific ledge No. 2 has been advanced 7 feet. During the week cut a small vein of about 7 inches, but have some reason to doubt it being No. 2 vein. Its course would indicate that it will run into No. 3. As they continue their cross-cut a short time will determine. The vein cut, though small is valuable, a first-class showing from the ore being obtained from the horn. Everything in and about the mine is looking well.

STANDARD CON.—The north drift 400 level has been extended 19 feet. The west cross-cut from 1st south, 400 level has been extended 16 feet. The south drift from the same has been extended 10 feet. Have repaired the main upraise 3d south 165 feet. The north drift 560 level has been advanced 19 feet. The south drift on the same has been extended 9 feet. The stopes are looking well.

Nevada.

DELHI.—North San Juan *Times*, May 27: We saw the other day some quartz taken from the 300-level of the Delhi mine which showed free gold in large quantities. It had the appearance of having been run into the rock while in a molten condition. A small piece taken from the surface rock was still richer in gold than the other. The vein from which the first-mentioned rock was taken is 11 feet wide. All the rock taken out is milled; there is no refuse rock whatever. This mine is certainly the richest quartz mine in the county. This month's run will probably yield $12,000, besides the sulphurets, of which there will be many tons, and which will produce $100 to each ton.

STARTED UP THE MACHINERY.—Nevada *Herald*, May 28: This afternoon the new hoisting machinery at the Cap. Fleming mine was started up. All the stockholders in this promising property, besides several invited guests, were present to witness the starting. Everything worked smoothly and those interested felt satisfied with their late investment.

Placer.

CHICAGO MINE.—Cor. Placer *Argus*, May 28: We descended the main shaft to the 100-foot level, thence we proceeded along through a drift about 200 feet, then descended into the stopes, in which about 16 Chinamen are at work taking out ore, each having a stope of his own, and being strung along about 100 feet on each of the winze, (through which we made the descent) one under the other, so that the working of one stope does not interfere with the others. They carry a five-foot face. After passing down through the stopes we went through the ore chutes, which are built above the 200-foot level. There we found a supply of ore, some of which I examined and found to be rich in sulphurets, and there is promise of a fair return on the free milling ore. At the 200 foot level I went north a distance of 300 feet to the face of the drift, where I found a well-defined ledge of sulphuret ore, about two feet in size, between walls of solid granite as smooth as polished marble, thus showing conclusively that the Chicago is a true fissure. It is the intention of the management to sink 100 feet more immediately, and open up the mine on both sides of the shaft by running levels north and south. They have as fine a 10-stamp mill as there is in this section of the country. It seems to be complete in every department, having a No. 6 Golden Gate concentrator. It has all the late improvements of machinery of that character, and has to be seen to be appreciated, Owing to the repairs going on in the shaft they are not running the mill, but Mr. Hall says they can get the mill ready in two hours' notice. He expects to be in full blast by the 4th or 5th of June at the latest. In looking over the mill I noticed the peculiar brightness of the apron and silver plates, and on inquiry found that they are using the electric amalgam manufactured by Dr. Ray & Co., San Francisco, which supersedes quicksilver, and is likely to take the place of all chemicals heretofore used for amalgamating purposes, the mill foreman at the Chicago saying that it is a saving of 50 per cent over all other material or preparations heretofore used by him.

MORE OF THE MAYFLOWER.—*Herald*, May 30: Two weeks ago we mentioned the fact that at the Mayflower mine, near Forest Hill, they had struck the main divide channel, and were taking out some very rich gravel. Mr. P. Crary, who returned several days ago from another trip to that divide, says the channel is wide and known to be very extensive, and the richness of the gravel beats anything he ever saw, and he is an old miner. There are chunks of it that seem to bave only rocks and cement enough to hold the gold together. One pan from some gravel taken out while he was there was washed and had in it in 22½ ounces of gold, or about $400. The developments in the Mayflower will give a stimulus to other mining enterprises in that locality, and thus enhance the prosperity of the community, and indirectly of the entire county.

Plumas.

FOUR HILLS MINE.—Greenville *Bulletin*, May 30: Robt. Penman, just over from the Eureka country, says that a sale of the Four Hills mine for a large sum, is reported. This mine has been very rich, but the owners were unable to properly develop it. It is contended that it will be a second Plumas-Eureka.

GOLD STRIPE.—The air shaft was completed last week, and now the work of pushing the tunnel ahead is in progress. Several men are employed, and work will be prosecuted as energetically as possible. The prospects of this mine are good, and if developed, it is thought that it will be one of the best pieces of property in the district.

FOREST KING.—Work in the mine continues with regularity. Pay ore is being taken out and sent to the Arcadia mill. A few days ago the large belt gave way so completely that the mill had to stop until a new belt arrives, which is expected to-day. Immediately upon its receipt, the mill will be running again. Since the crushing of ore began, the product of gold has been satisfactory.

GREEN MOUNTAIN.—The upraise in the Sulphuret chute has reached a distance of 90 feet. The air is not sufficient to run the drills and supply the upraise. The tunnel, therefore, is being pushed ahead by the use of hand drills. Work on it will so continue till the upraise connects with tunnel No. 5. Stoping in the Sulphuret chute continues, and the ore is being sent to the mill. There has been no change in the character of the rock since the last report. The quartz in the upraise prospects about the same as that in stopes. There has been some trouble in consequence of a large amount of water to contend with, but the quantity is becoming less, and the trouble from that cause will have ceased entirely by the end of two weeks. The mill is running regularly, and good worked is being done.

Sierra.

CLEAN-UP.—*Mountain Messenger*, May 30: Bald Mt. Extension Co., Forest city, cleaned up for last week's work 106 ounces, and for the previous week 139½ ounces. Red Oak tunnel is now 502 feet long, and the face is now in soft slate rock. Cap. Wilbourn and J. T. Mason left for the mine Thursday morning. The pump at the Extension shaft will be started up next week, to furnish water for washing gravel, and for air. Parties from Buttes are making preparations to run a prospect tunnel at the head of Secret ravine.

Trinity.

DOING GOOD WORK.—Trinity *Journal*, May 30: J. R. Flagg, foreman in the Hayes Red Hill gold mines, tells us that they are doing splendid work in the McKinney mine. Three large size giants are in use, water is plenty in the Canyon creek ditch, and gravel is being moved at a rapid rate. The prospects are also reported as being most satisfactory.

BIG PROSPECTS.—The Eureka *Times-Telephone* says word has reached that city that a rich strike has been made in the Hunter mine, at New River, and that the prospects were equal to those of the Hard-Tack, the best mine in the district. The Hunter is owned by W. H. Johnson and other residents of Eureka.

PUSHING WORK.—Smith B. Brooks arrived from New River on Friday morning, and reports work at the Mary Blane as progressing rapidly in both mine and mill. They are sinking on the ledge, and the developments of the past few days show it to be better than ever before. The Murchie Bros., late of Nevada City, have charge of operations, and are represented as experienced and intelligent miners.

PROSPECTING.—Messrs. Geo. W. Ward, P. H. Riffe, Boswell and Jones arrived this week from Shasta county, and will spend some time prospecting in Trinity. Mr. Riffe is regarded as an expert seam or pocket prospector. From a recent find in the vicinity of Muletown, he pounded out 15 pounds of rock and realized 10½ ounces of gold.

SCARCITY OF WATER.—Mr. H. Hickok, who has been superintending the Buckeye property the past season, was in town this week. Like all other hydraulic miners of the county, he complains of the scarcity of water during this season, five hours water per day being the most they were favored with. The Buckeye ditch was not full at any time.

BETTER YET.—In referring to the recent clean-up from Monte Christo ore in Deadwood District last week, we did not get the yield large enough. The quantity of rock crushed was 62 tons, and the amount realized was $6,700, exclusive of sulphurets. Messrs. Ramm & Van Metre were in town this week and inform us that there is more of the same kind of rock in sight. And yet Deadwood has never had any great boom. But its mines are the best on the Coast, and they are building slowly and solidly on their own merits.

Tuolumne.

PIPE.—Tuolumne *Independent*, May 30: The pipe for the Gold Mt. Water Co. arrived Sunday night for the connection at Divoll's mill. A. A. Moore has the contract to put it in place, and the work will probably be completed by to-day. Divoll is actively at work making an underground map of the Bonanza and its workings. All the gold heretofore taken out has been from the hanging wall, which, he says, is a mere prospect to what may be expected when the foot-wall is mined.

ACTIVE.—*Union Democrat*, May 30: There is more business activity in Soulsbyville now than has been the case for a long time. The recent rich developments in the Soulsby mine and the consequent large increase in the working force are the causes of the revival. The mine is now working between 45 and 50 men. Stoping is being vigorously prosecuted on a large body of very rich ore, enough of which is in sight to keep the mill running for a year or two. A favorable report comes from the Lamphier mine which is steadily working with a good force. A new development has been made at the south end of the mine which promises to be of great value. A chute of very fine milling quartz was recently struck near the surface. It is being rapidly developed and promises to turn out an extensive deposit. This discovery has greatly enhanced the value of the property. The Stanislaus River Gold Mining Co. is pushing operations on the big tunnel to turn the Stanislaus river at Reynolds' Ferry. Work is being prosecuted at both ends with day and night shifts. The south end of the tunnel is in about 350 feet and the north end over 200 feet, leaving only about 500 feet to run. The shaft at the Hyde mine is being sunk as fast as three shifts can do it. It is now down 230 feet, and the progress is at the rate of two feet every 24 hours. The vein is large. Recent assays run from $13 to $104 per ton. Ben Seeber continues to make good runs from the Chrysoline mine at Whisky Hill.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, May 30: Since last weekly report both lower levels have been thoroughly cleaned out from the mud and debris resulting from the flood, the timbering repaired and work on the 3,000 level resumed. Cross-cut No. 1, 90 ft north of the Chollar line, has been started up, and is steadily being advanced westward. It is now in 85 ft; and the last 30 ft is in quartz of fine quality, showing considerable ore. Nothing is being done on the 2,900 level, by reason of all the force and air being needed in conducting operations elsewhere. On the 3,000 level, the main lateral drift north was started up again day before yesterday and is making good progress in good working ground. Its course has been changed a little more to the westward, in order to range gradually into the ore vein which is about 40 ft distant. The advancement of this drift toward the Savage mine possesses considerable significance, as developing the Hale and Norcross ore vein in that direction. It has a very good show and plenty of room to develop into a real bonanza at that point. The air gallery on the 2400 level, to connect with the northwest drift to the Savage incline for air circulation purposes, is making very good progress. It is already advanced 60 ft, and has about 100 ft further to go. This large drift, or gangway, when completed will be a very important addition to the ventilation facilities of the mine. In fact it is indispensable to the working of the levels below.

CON. CALIFORNIA AND VIRGINIA.—The drift connection with the Gould and Curry 1,700 level is well completed, put in first-class order, and furnishes a splendid ventilation to a quarter where it has been very much required. From the 1750 level 571 tons of ore were extracted last week, assaying $22.55 per ton. From the stopes of the 1,200 and 1,350 levels, under the Jones contract, 878 tons were extracted, assaying $18.62 per ton from mill battery samples. The framework of the new building over the old Consolidated Virginia hoisting machinery is inclosed and will soon be completed. The timbering around the mouth of the shaft is renewed and in first-class order, and the platform around it and beyond it is renewed of two and a half inch plank, ready for the erection of additional building if deemed requisite. The old shaft is found to be in very bad order at several points, requiring substantial repairs. This will probably be done, for the machinery is of the best order and all that is required, and the shaft is important for ventilation and ore hoisting.

BALTIMORE CON.—The new roasting furnace is completed, and fire has been started under it. Ore hoisting from the 450 level, which the tributers had stored away in the drifts, commenced Thursday morning, the main hoisting works being started up for the purpose. Only enough was hoisted for a commencement test of the new furnace, which was being charged yesterday with pulp from the little 5-stamp mill near by. A few tons of high grade ore are being hoisted from the 225 level, and the parties working at that point find a very good ledge in their winze, of the same character ruby silver, etc., as that being worked on the 450 level.

CROWN POINT.—The shell of the old bonanza holds out well, and gives pretty good gleanings and plenty of it, the old ore stopes yielding a very good showing of low grade ore. The Belcher upper levels worked through the Crown Point, also hold out well.

CHOLLAR.—The 3,000 level has been cleaned out and put in complete order since the flood, and work is resumed in cross-cut No. 3 west, the face of which is in very promising vein matter, carrying spots and bunches of ore.

ALTA.—The prospecting above the 950 level have extended to about the 850 in the shape of an upraise following the vein in the foot wall. Good bunches and stringers of fair grade ore continue to be met with.

OPHIR.—On the 500 level the crosscut to connect with the old Mexican shaft is progressing well, and joint cross-cut of the Ophir and Mexican on this level is making good advancement.

WOODVILLE.—The tributers on the 400 level find some very good bunches and streaks of ore that gives pretty healthy assays, and will doubtless give satisfactory milling returns.

YELLOW JACKET.—The regular good yield of ore from the old upper workings continue right straight along. The stopes about the 400 level especially are looking and yielding finely.

OVERMAN.—About a dozen tons per day of low grade ore continues to be the yield from the 226 level through the old Petaluma-street tunnel.

MEXICAN.—The joint Union and Mexican drift on the 500 level and also the west cross-cut on that level are both making good progress.

GOULD AND CURRY.—East cross-cut No. 1, near the Savage line, on the 1,000 level, is going ahead well in favorable ground.

BULLION.—The drift from the 160-foot station, west, has passed into fine looking quartz carrying spots of ore.

KENTUCK.—The old upper levels continue to yield partly enough low grade ore to keep the Rock Point mill running.

SIERRA NEVADA.—The north lateral drift on the 520 level is making rapid progress in very favorable working ground.

BEST AND BELCHER.—The joint drift on the 1,000 level is making good advancement in favorable working ground.

Antelope District.

WHAT IS IT.—Genoa *Courier*, May 25: Parties interested in the so-called tin mine in Antelope district have great faith in the discovery. As yet they have not been able to determine what the ore contains, but when the rock is burned a metal resembling pewter is obtained which, when cool, is much harder than iron or steel. The tinsmith who happened to be traveling through that part of the country at the time of the discovery, had worked for 20 years in the tin mines of France, and he believes they have tin ore. The rock has been assayed in different offices on the coast and some of it sent to Europe, but thus far nothing definite has been learned. It is believed by some that the rock does not contain tin, and that the metal is aluminum, which is more valuable than tin. Aluminum forms alloys with most of the metals.

Castle Dome District.

SILVER ORE.—Cor. Eureka *Sentinel:* Castle Dome district, a few miles below Willow creek, on the same range of mountains, has had quite an excitement over a rich lead of silver ore struck some two months ago, and assaying way up in the thousands. We do not hear much of it lately, but we believe it still holds out, though the rich seam is very small. Rich float may be found all over this range. Very little good prospecting work has been done, but what has been done shows better results than I have seen in any other camp in the State. There is a fine field here now for good intelligent prospectors—plenty of feed on the hills and water in every canyon.

Esmeralda District.

CAPITALISTS.—Carson *Free Lance* May 25: Mr. J. C. Coulter, in company with English capitalists, is here. The result of the visit of these people will be made known in due time. Mr. Coulter has been persevering in his efforts to have an English company take hold of some Aurora mines, and now that they are represented here, large sales are confidently anticipated to be made. Should such good luck befall, Aurora will again resume its place among the towns of mining note in Nevada.

Lewis District.

RUNNING.—*Butte Mt. Nevadan*, May 26: The Pittsburg Mining Company's mill is running steadily

and the regular shipment of bullion is being made. A one-third interest in the mine has been sold to Mr. Cardwell. Mr. G. W. Bothwell is building an addition to the mill, and will put in another crusher for the purpose of working Morning Star ore. The mines are looking well, with plenty of ore in sight. A force of men are at work on the Eagle mine, extending the main drain level and sinking. There is quite a pile of ore on the dump, and prospects are good. The Betty O'Neal hoisting works, machinery and mining tools were sold at Sheriff's sale Thursday, for costs of judgment obtained by R. Gillis, J. F. Dennis being the purchaser. The boiler and machinery will be put in order, the water pumped out, and prospecting on the lower levels commenced right away. A force of men are to be put on, and the work prosecuted as rapidly as circumstances will permit. J. W. McKittrick will be superintendent of the mine. Ten tons of ore have been shipped from the Betty O'Neal to Salt Lake for reduction, the owners being desirous of learning its actual market value.

Mount Cory District.

WORKING.—Walker Lake *Bulletin*, May 27: A few men are working in the Mount Cory. Work on the Jumbo tunnel will soon be resumed. There is a talk of a small mill for Coon Hollow. A day shift has been put on the Gypsy Queen by Al. Finney. There will soon be four or five paying mines in Coryville. Another ledge has been uncovered in the North Star ground. It assays well. The Snowbird, North Star and Silver Brick mines are all sending out ore of good quality.

Red Canyon District.

GOLD.—Carson *Free Lance*, May 25: Another body of rich gold rock was encountered in the Knox & Nixon mine in Red canyon, last Thursday. This strike is made in one of the deepest levels in the mine and is supposed to be a continuation of the rich chimney cut in one of the upper drifts last December. Some of the specimens consist of about equal parts gold and white quartz, and are very beautiful. This is the fifth rich strike that has been made in that district within as many months, any one of which, if made in any other part of the world than Red canyon would have set people wild with excitement and induce the investment of thousands of dollars in prospecting. In this instance we have not heard of a single mining man even going out to look at it.

Secret Canyon District.

LEASE.—Eureka *Sentinel*, May 27: Dick Berryman and a party of miners have taken a lease of one of the principal mines in Page Canyon, Secret Canyon District, and there are a number of other miners talking of taking chances in that locality, where the formation is favorable for working, and rich ore has been found in very good sized deposits.

Star District.

OPENING OF AN ANTIMONY MINE.—*Silver State*, May 30: 'Squire J. M. Brown, of Unionville, has leased an antimony mine in Star District, and let a contract to run 150 feet of tunnel to open it He has had considerable experience in working antimony mines, and is confident of finding a large body of ore in Star, though he will have to spend considerable money in getting the mine in working condition.

Washington District.

AT WORK.—Belmont *Courier*, May 25: Uncle Billy Koch is hard at work running the tunnel in his mine at San Juan, Washington district. He has cut through two ledges that carry ore of low grade. He expects to tap the main ledge in a few weeks with hope that the ore will prove of a better quality. In the early days of Nye county considerable work was done in Washington district, but the ore proving of a rebellious character the mines were abandoned and until a few years back have attracted no attention. There is one patented mine in this district—the St. Helena—that shows a big ledge of this rebellious ore. Experts think that with the improved reduction facilities of the present time the ores of this district ought to be profitably worked.

Willow Creek District.

COMING TO THE FRONT.—Cor. Eureka *Sentinel*, May 26: Willow creek is steadily coming to the front as a mining camp. Reports of new and important developments in many of the claims are coming in daily. The prospectors seem to have wakened from their long winter sleep, and all over the hills the clang of the pick and the shock of giant powder may be heard. The Ohio mine is making regular shipments of its high grade ore to Salt Lake, while the second-class ore is being stored in the mine and on the dumps, awaiting the time when reduction works may be erected by the company. About 20 men are employed at the mine. The Wild Deer mine is looking better than ever. Ore is being stoped out from the 100-foot level to the surface. In some places the pay streak is three feet in thickness. Fine specimens of horn silver and ruby silver have been taken out lately, some of them assaying as high as $3,500 in silver, while assays of from $50 to $250 in gold are not uncommon. A contract has just been let for a tunnel to connect with the 100-foot level, which, when finished, will greatly facilitate the extraction of ore, and will open up 150 feet more of stoping ground. The mill, under the guidance of Bill Long, is doing splendid work, turning out bullion .885 fine, and working the ore to over 80 per cent of the assay value. This may be interesting news to some of the cranks who have formerly had charge of the mill, and who pronounced the ore rebellious. When ore has 10 per cent of sulphurets and is handled with 90 per cent of ignorance and incompetency, it does make pretty rebellious ore. Mr. Long also saves 90 per cent of the gold in the rock, and the two bars of bullion shipped to-day are richer in the metal than any ever produced in this camp.

ARIZONA.

RICH STRIKE.—Arizona *Miner*, May 22: We were shown a couple of sacks of very rich carbonates of copper ore, carrying free gold in abundance, by Mr. Tighe to-day. The ledge was a blind one, and no doubt was run over dozens of times by prospectors. Mr. Tighe says he has known of this ledge for over a year, and came back here from California to record and develop it. This new bonanza is situated at the head of Lynx creek, where the ledge was uncovered and revealed over 21 feet of solid ore. Mr. Tighe says he has secured a good mill-site in connection with the property. The miners in the vicinity are considerably exercised over this find, and are digging like gophers looking for extensions. This is the second rich find made on Lynx creek in the past three weeks. The Maggie mine on Turkey creek, is being vigorously worked by the lucky owners, Jerry O'Neil and John Martin. They have a shaft down about 60 ft. with 2 levels, including a 20-foot winze. The ore is getting richer as every foot of progress is made. The pay streak runs from 6 to 8 inches in width and will average from 100 to 300 ounces per ton of silver. The ore is galena, carrying chloride of silver. They shipped three tons of ore to Pueblo, Col., for reduction, through the Bank of Prescott. These boys have worked hard and stuck by their claim for the past year, and we hope they may reap a rich harvest from their perseverance. Mr. McDonald was in town yesterday and informed us that he and his partner, Nelse Gabriel, had struck it rich at the bottom of their 60-foot shaft, on the Mark Twain mine. They have about 6 inches of $900 ore. They will put on a couple of men immediately and will commence taking out ore for shipment. We hope soon to hear of lively times in the Dosoris camp. We hear that the Milligan mine on Lynx creek is showing up finely. Mr. Milligan, the owner, has a shaft down about 100 ft, and is taking out some rich gold ore, which he intends having worked. This is considered to be one of the first class gold properties of Yavapai county.

COLORADO.

IDAHO SPRINGS.—*News*, May 26: Prospecting is quite lively on the Ute and Cascade creeks. Wagon load upon wagon load of brick is passing through town daily for the new business blocks and smelter. Shipments of ore were made this week to the Idaho Concentrating and Sampling Co.'s works from prominent properties on Ute creek. Work upon the Osbiston smelter goes along steadily. It is beginning to assume huge proportions, and it will not be long before it will be throwing out sulphurous fumes. The Idaho Concentrating and Sampling Co., a new company recently organized, have leased the Mott works, and will carry on a concentrating and ore purchasing business. Marion Whitney is working on the German, and manages to take out enough to keep sugar in the cupboard. At one time, a few years ago, Whitney took out of the German over $8,000 in a few weeks. We understand that the Cascade M. and D. Co. is contemplating resuming operations in Cascade District. This company has a group of valuable patented properties on the Cascade slope, which will probably soon be actively worked. Scaton Mountain is alive with miners. We are sorry to note that the Foxhall Tunnel Company have suspended operations. They, like most of the people who run tunnels, stop where they should begin—or, perhaps there is a small game of freeze-out being carried on. The Lilly Co.'s stamp-mill is pounding away day and night on ore from the mine. The mill, under the management of Alex. Taylor, has been repaired and put in first-class order. Two half-cord wagons, with four mules each, are hauling the ore from the mine. More miners will be put on as soon as the platforms are partially cleared of ore. South of the Champion is the once famous Specie Payment, lying idle, with the engine and works going to ruin. This mine has produced richer gold ore than any mine ever discovered in the State. The present depth of the property is not quite 300 feet, but bad management got it into trouble, and we suppose it will lay idle until some one will purchase it from the present owners and start it up.

NOTES.—Colorado *Miner*, May 23: Byers & Co., lessees on the east drift of Victoria tunnel level, intend shipping about 20 tons of ore the last of the month. A mill-run this week from the Swamp Angel lode, in Chase gulch, worked under ease by Rockwell & Co., gave 219 ounces silver to the ton. A mill-run brought down from the Fred Rogers lode, on Democrat mountain, by A. McNulty, the first of the week, gave 436 ounces silver to the ton. Beck & Twibell, lessees on the Mendota mine, on Sherman mountain, shipped a carload of ore, containing 18 tons, from their workings, on Thursday, to Golden. Byers & Co., lessees on the Telephone lode, on Brown mountain, brought down a run a few days ago, which gave 177 and 67 ounces silver to the ton, according to class. The Joe Reynolds lodes, on Silver creek, are all looking splendidly, and the different lessees are taking out large quantities of good ore. Silver creek, for its size, has no equal in the mountains. Barney O'Connell & Co., lessees on the Nyanza lode, on Democrat mountain, have exposed a vein of solid ore two inches thick, and a mineralized quartz streak 12 inches thick. The last mill-run from these workings gave 277 and 63 ounces silver to the ton, according to class. Byers & Co., lessees on the Telephone lode, Sherman mountain, are stoping on a vein of sulphuret ore, ranging from one to four inches in thickness. Mr. Byers informs the *Miner* that there is ore exposed in nine different parts of the workings, ranging from one-half to two inches in thickness. Daily district will be the scene of a great deal of activity this summer. Quite a number of claims that were worked under assessment last year, showed up finely. One claim, upon which the assessment was done, the owners realized $1,400. Messrs. Julian Stanton, Armstrong Shepard, Rob't. Mattern and others, have all good claims, which they propose working this summer. Ballard and Sol Robinson have also some good claims in the district, which they intend working this season.

IDAHO.

TO BE LEASED.—Wood River *Times*, 27: M. T. Richardson, owner of the Red Elephant group of mines near Bullion, is in town to-day. He reports the Red Elephant a second Jumbo, and looking better than ever before. The ore increases in extent as he sinks upon the vein, though it does not seem to increase much in richness. As his health will not permit his continued residence in that section, Mr. Richardson will put leases on his mine and slide down to where the air is more moist and heavy. Two leases have already been let, with one or two more to follow soon.

PLACERS.—Idaho *World*, May 22: K. P. Plowman made a clean-up last Saturday in his placer claim on East Hill, after a run of 30 days. The amalgam weighed 52 pounds, so the clean-up will go about $7,000. Last year Mr. Plowman commenced work on May 23d, and this year made his first clean-up on the 23d of May. Plowman owns all of East Hill, and has ground enough to keep his two hydraulic chiefs going every season for 20 years, and the ground is all good. He has a big fortune in that hill. Mr. Plowman has been a go-ahead miner and plucky, but very unlucky in this camp in his mining ventures for over 20 years, but kept on driving ahead against the breakers.

AT SAWTOOTH AND VIENNA.—Col. Brodhead was in town to-day from the upper country, having come to appear before the grand jury as a witness. He reports the road between Ketchum and Sawtooth in such good condition that he traveled it in seven hours, the other day, with his own team. Another ore-body which promises to be more extensive and richer than any yet found in the mine, was discovered in the Vienna a few days ago. The mill of the Colman (Vienna) Mining Company will start up to-morrow, with a supply of ore ahead ample for the season. The remainder of the machinery for the Silver King concentrator left Ketchum this morning. The works will probably be started up in two weeks, and make shipments of ore to Wood River regularly thereafter, if successful they will prove a great help to the upper country, as it is stated that there are over 2,000 tons of ore on the dumps ready for concentration, that cannot be marketed. Col. Brodhead will begin sending ore to the concentrator as soon as it shall be ready to receive it.

MONTANA.

MILL.—Helena *Independent*, May 30: Messrs. Brooke, Elge and Wormer have purchased a 10-stamp gold quartz mill for the purpose of working the quartz from their valuable gold leads, the "Parker" and "Griff," near Bald Butte. Upon the Parker and Griff mines there have been five shafts of 100 feet each sunk, that shows them to be immensely rich lodes, every shaft shows from 1 to 15 inches of ore that will go from $5,000 to $9,000 per ton, and four feet that will average over $40 per ton. The owners have leased the property to parties who are under bond to give them 15 per cent of the gross proceeds for the privilege of working it. That these mines will prove bonanzas to their owners no one doubts. Good news has reached the city from the Elkhorn mine, in Jefferson county. In the 500-foot level, some marvelously rich ore has been struck, "richer than ever." "There isn't money enough in Montana to buy her," said one of the owners to an *Independent* reporter yesterday. This mine has already made its owners worth several thousands of dollars and its present outlook promises that they will all be millionaires. From a prominent merchant of our city and one of the owners of the Helena lode, who took a trip out there yesterday, we learn that on the Helena lode they have struck it richer than ever, that plenty of ore is being taken out and sorted for shipment, and that from ores that have already been shipped handsome returns have been received. It is said that other mines in the same vicinity are being extensively worked, and the owners of all of them are in high spirits over their prospects. The Helena mining and reduction works are doing an immense amount of work this month, and the indications are that the returns at the end of the month will show up larger than ever before. The new Gregory shaft is now down 135 feet. It is expected that it will reach 600 feet in a very short time, as work is being pushed with surprising rapidity. The Drum Lummon is booming, and it is estimated by prominent mining men that the output for May will run over $100,000, an increase over April of nearly $15,000. Reports from mines in every direction are good.

BUTTE.—*Miner*, May 27: All the mines, mills and smelters in the camp are bowling along in good shape and the output is as great if not greater than ever before. A short tour yesterday showed that at all points work was being pushed and additions made in many of the mines, and the indications are the supply will be largely increased. The Alice is reported as doing better than ever before, the yield being 60 tons per day. The increased yield is cross-cuts and levels to the depth of 60 feet. The caused by the development of the old stopes and veins on the north vein and by new discoveries in the south vein, which has been opened by series of main shaft has been sunk to the depth of 800 feet and a cross-cut north is contemplated. This cross-cut will open new ground, as it will be 200 feet further east and 20 feet deeper than the cross-cut run from the bottom of the winze from the 700-foot level. The Springfield people report a rich strike. New machinery has been placed in position. The pay streak is now 15 inches wide, and a large block taken out yesterday assays $568. It is free-milling ore, and the vein will undoubtedly average $250 by bucket sample. The Moulton is being pushed for all it is worth in the 300, 400 and 500-foot levels. The north vein of the 500-foot level is being developed, and the showing is very good. The wood flume of this mine has just been rebuilt and is now floating 150 cords per day. The Montana Copper Company are rustling along as usual and working without intermission. The Colusa is still producing its splendid grade of ore, and the West Colusa is being developed by sinking a 300-foot level, and expects in a few weeks to reach the desired depth. The Parrot Company are working over 300 men in the mines and smelter and are drifting considerably, but at present are not sinking. The ore body is excellent and the capacity of the smelter is taxed to treat the ore. At the Patsy Clark group, extensive preparations are being made for work, including new buildings, furnaces and other necessary paraphenalia. At the Georgetown a fine vein has been struck which assays very highly. The Valdimar is being worked at the east end of the north vein and a fine ore showing $90 to the ton is being taken out. Large quantities are being taken out and shipped to the Alice mill for treatment. The Orphan Girl is being worked to the extent of about 90 tons daily, of low grade free-milling ore, from the 40-foot level. The Dexter is doing the milling at the rate of 28 tons daily. The Lexington, which is now down to 650 feet, have been arranged to sink an 800-foot level. A pair of new boilers and other additions will be placed in position within a week or two. The Gagnon is only working in the 400-foot west level, and taking from the faces and stopes 25 tons of ore daily. The Silver Bow is treating about 30 tons daily from the LaPlatte mine, of excellent grade, which is about all it can manage.

NEW MEXICO.

GOLD HILL.—Cor. Silver City *Enterprise*, May 29: Col. Bob. Howland, of San Francisco, an old-timer in this section of the country, expects in a very few days to commence operations in our camp. He has viewed several of our gold claims, and so far as his observations extended he is very favorably impressed. In all probability he will take the Homestead, the property of McCone, Keister and Hargrave, should he be able to secure a bond in the absence of one of the partners. This claim being favorably situated and easy of access, is among the first mines on the gold belt to attract attention. The bonanza claims continue to hold out, much to the satisfaction of their owners. Lone Hand and Old Georgia still produce horn silver and sulphides in abundance. They are now down 25 feet and 18 feet, respectively, and the ore if possible, is richer now than at any period of development. Twelve inches is the average size of the pay streak, which will easily work $600 per ton by mill process. Work on the Grand Tower has been resumed with flattering results. Northern Belle continues to pan out satisfactory. A lot of ore now out is awaiting shipment. Work will shortly be resumed on the Treasure Box. Reservation is now idle, but work will be resumed in a few weeks. Bargy, B. & S. and Cold Spriog are looking as well as ever. The Chapo on the north side of the range, is in statu quo, the owners, Shedman and Wines, having concluded to let it rest a while—at least until the Indian troubles are better understood. This no doubt is a wise move on their part, as the claim is situated directly on the Apache trail. A fair average test recently taken from across the ledge gave returns of 83 ounces per ton in silver. Assessment work has just been completed on one of Lucas & LeDoux's claims on Gold Hill, which promises fairly. The vein is six inches in width, and shows up good ore. No test has yet been made. Barney Cox, George Black and Charley Stone are millionaires in prospective, having located a big thing which all the time has been laying out of doors in plain view of the camp. The Setting Hen, the name by which the boys expect to acquire wealth and fame, is now on the nest; the chickens are being counted daily.

UTAH.

THE CHRISTY COMPANY.—Southern Utah *Times*, May 25: The mill worked 280 tons of ore last week, which will average about $25 per ton. At the California, drifting continues on the fourth level south, and considerable quantities of very good ore is being extracted from this portion of the mine. The ore bodies hold out good on the third and fifth levels. There were 35 tons of ore shipped daily from the mine last week. For several days past there have been rumors floating about the camp of a big strike having been made in the new shaft. Last Monday we paid a visit to the mine, and through the kindness of Mr. Al. Grant, foreman, we were able to make a personal examination of the new find. It will be remembered that under Captain Lubbock's management the old company were taking out of the Tecumseh and Stormy King immense quantities of high grade ore, when a break in the country rock was encountered which completely cut off the ledge. This break occurred about 125 feet from the surface, and, notwithstanding the fact that a great amount of prospecting had been done, the ledge was never recovered by the old company. When the new company began operations, prospecting for the lost ledge was resumed; and while several rich pockets of ore were struck and parts of the vein met with in broken ground, at different times, the ledge was not found in place until this present strike was made. The point where the ledge was rediscovered is about 420 feet north of the new shaft on the Stormy King ground, 140 feet below the break. A drift is run in on the ore a distance of 50 feet, where a winze is being sunk on the ledge which is now down to a depth of over 40 feet, exposing three and one-half feet of high grade ore. The ground is firm, the walls perfect and the pitch of the vein to the west conforms to the strata of rock in the Buckeye and White Reefs. This is the most important strike that the Christy Company has made since resuming operations, as it demonstrates the fact that the Tecumseh and Stormy King are mines more valuable than when they were the leading producers of the camp.

REVIEW.—Salt Lake *Tribune*, May 29: The week has been generally clear, but rather cold for the season. The movements of the metals have been fair. The shipments out from this city for the week ending Saturday, May 23d, inclusive, were 1,272,682 pounds. The receipts in this city for the week ending May 27th, inclusive, were $76,482.88 of bullion, and $9,636.07 of ore; a total of $86,118.95. The week previous the aggregate receipts were $75,591.27, of which $61,481.27 was bullion, and $14,110.00 was ore. The Ontario has resumed shipments, after the annual clean-up and overhauling of the mill. The first of the new run was reported on the 26th—of 38 bars, valued at $23,264.54, bringing the total product of the year up to $645,980.08. There is nothing yet to report from the Horn Silver, locally. The silver sandstones yielded during the week four bars of the white metal, of which the Stormont sent up two silver bars, valued at $3,450, and the Christy two silver bars, $3,100. Stormont stock sold during the week in New York at 9 to 11c. Riter bullion, from Tintic, is another pleasant feature during the week; 10 bars of it were received, valued at $5,600. The product of the Hanauer smelter for the week was nine cars of bullion, $22,750. The Germania produced during the week seven cars of bullion, $18,318.34.

CHLORIDING.—There are 30 chloriders at work on Tecumseh Hill. The hill with its multitudinous prospect holes, resemble an immense honey-comb, and one unacquainted with the country would suppose that all the ore near the surface was gouged out long ago. Yet, some of the boys are making good wages, and all seem contented. Every now and then a rich bug-hole is struck which maketh the heart of the finder glad, and encourages others to persevere in their search for rich pockets.

THE STORMONT COMPANY.—The stopes look well and the usual number of miners are engaged in working the mines. An average of 37 tons of ore per day was shipped from the company's mines to the river mill during last week, giving a result of $3,760 worth of bullion.

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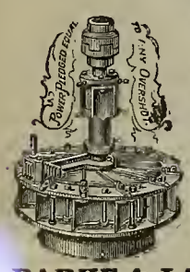

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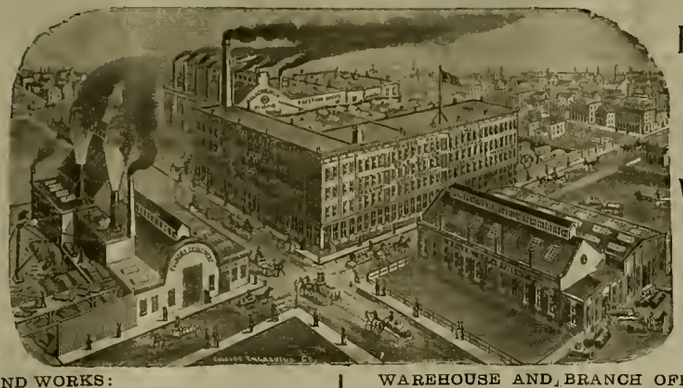

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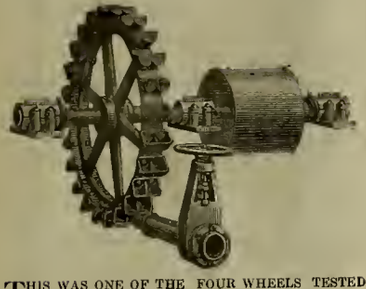

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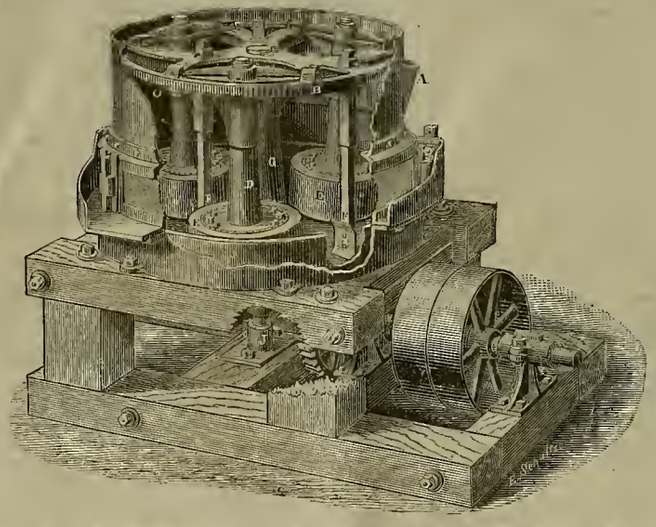

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Shasta County Districts.

[From our Traveling Representative.]

Flat Creek District.

This district lies on the west slope of the ridge of mountains extending along the right bank of the South Fork and main branch of Squaw Creek and takes in a greater portion of the country between Squaw Creek and the Sacramento River. Comparatively speaking, the district is not only new but undeveloped as well. The mineral bearing formations carry gold, copper and silver, the latter, however, predominating. As yet the field is prospected but little, and were such a showing as exists here to be made in Arizona or New Mexico there would be a boom in mining that would turn the hills inside out. The leading prospects of the district are owned by Redding people who are well-to-do and able to hold their mines until they get ready to sell. The owners are progressive business men and while they may hold out for a big figure for the group an investigation of the mines justify their so doing.

The Windy Camp Group.

Eight locations consist of the above group. The claims are continuous and cover a distance of over 10,000 feet in length and 600 feet in width. Commencing on the northwest end 700 feet above Squaw Creek is the Balaklala, followed southwesterly by the other claims as follows: El Monte, Fortune, Mule, Huckleberry, Windy Camp, Yellow Jacket, and Coldwater. These locations cover a mineral belt that varies from 40 to 600 feet in width and occurs between granite and porphyry formations coursing NE and SW. The belt thus located is well defined and wherever developed shows satisfactory results in quantity and quality of ore exposed. The ore carries gold, copper and silver, the latter predominating.

A Phenomenal Property.

A full and correct description of this group of mines would read too flattering to find endorsement from any save those who had visited and inspected the property. As a lasting and steady paying proposition the locations are without an equal. As a high grade bonanza it is a failure. Capital in search of mines that have ore in quantity; easy of access, cheap to mine and not difficult to treat could not do better than with such a property. The vein matter, if veiu it can be called, is a mixture of mineralized porphyry, silica, iron-gossan and a reddish sedimentary formation of the character of oxide of iron. Deposits of sulphide and native silver, gold and copper are the principal products; silver predominating to about 70 per cent., gold and copper the remainder. Occasional deposits of sulphurets occur throughout the mineral belt. The cropping over the entire claims is largely iron-gossan which runs well in sulphides and occasional native silver deposits. The great beds of this iron resemble in appearance those of the famous Sierra Grande mines of Lake Valley, New Mexico. The magnitude of the ore bodies of the Windy Camp group places it in the lead of the Sierra Grande and its advantageous surroundings make the mining and milling of its ores easier and by far more profitable. A mineral belt extending over 10,000 ft in length and averaging nearly 200 in width (no telling how deep, only 120 feet having been made in depth) the ore running on an average of $40 per ton is a fair statement of the extent of the ore body of this property.

Development Work.

Assessment work is all the development done on the group, with the exceptions of the Balaklala, Windy Camp, Huckleberry and the Mule, on which claims considerable work has been done. The principal development has been done on the Balaklala, on ths northeast end of the group, the Windy Camp near the southwest end, and the Huckleberry and Mule near the center, thus prospecting the group as one great mine. Near the north end of the Windy Camp a southeast tunnel, 110 feet on the hanging, has been driven in the ore ground and at its breast taps the ore 120 feet below the surface. At 70 feet from the tunuel's mouth a cross-cut 50 feet southwest and a 30-foot drift across the ore body to the foot-wall, showing the width of the ore body to he about 80 feet. A drift 50 feet along the foot-wall shows a continuation of the same pay streak. This work shows ore 120 feet deep, by 60 feet wide and 110 feet long, and no dead work done in opening the mine, as the development was all done in ore. Two parallel tunnels have been run in on the Huckleberry, some 200 feet apart. The showing is a black iron-gossan. The oxides and carbonates have given room to sulphurets of copper to a distance of 60 feet in from the surface. This will run from 7 to 30 per cent copper and run low in gold and silver. This claim appears to carry most of the copper of the group. The adjoining claim, the Mule, is the same as the Windy Camp, showiug very little copper. The Balaklala, on the northeast end of the group, is the best prospect. Three open cuts, one of 12 feet and two of 80, and a 24 foot shaft is all the work done on this mine. All of the work is in and on ore. Great croppings resembling ore piles cover the claim like a great iron quarry. The vein matter or ore body here is nearly 600 feet wide and carries sulphide, native silver, gold and some deposits of sulphurets. The ore is a high grade and is easily and cheaply extracted. The cost of mining and milling would be less than $5 per ton.

The Advantages.

Timber is abundant. Water is plenty and near by. A good wagon road can he built to the Sacramento River, along which the railroad runs, for less than $3,000; the distance hsing about three miles. Battery and plate amalgamation, concentration and a reduction of the concentrates would be a cheap and successful treatment of the ores. An inexhaustible supply of ore—and they have it here, is the main and necessary feature of a paying miuing and milling proposition. There are over 1,000 tons of ore on the dumps now awaiting treatment that will average over $30 per tou.

Business Men as Miners.

Business men as snccessful miners are few and far between. Large bodies, it is said, move slowly. The same can be said in regard to the development of a large mine. The owners of this group are already engaged in business, hence their capital is more or less tied up. Such a state of affairs is deplorable. If a mining man or men with capital and experience owned this group of mines and worked it for what it is worth it would make Shasta county's mineral resources notorious. Messrs. Weil, Willard, Conroy, Ellis, Murry Shay and a few other Redding men own the Windy Camp group, and while they do not "have to" sell it is hoped that in the interest of progressive mining and Shasta county's future as a bullion producer that some mining people will get hold of this property.

"The T. Shasta Bar."

A number of Red Bluff capitalists are pushing the work of changiug the course of the Sacramento river at a point 28 miles north of Redding. The scheme is a novel and feasible one and will, if carried out, prove a paying investment. A tunnel six feet square is being driven through the mountain a distance of 400 feet, 100 feet of which is already finished. By this tunnel the river bed will be bared a distance of two miles. The hill system above and along the side of the hed-rock about to be drained has paid hig. The river bed is a vertical slate one peculiarly adapted to holding any mineral that may have been deposited thereon. The 300 feet of tunnel yet to be driven is in a hard granite. A contract has been made for the completion of the work at $8 per foot; the tunnel to be through hy September 1st. Two miles of bed rock gravel will be exposed by this tunnel and the richness of the river above, the hills overhanging and the gold catching formations of the river-bed justify the expectations of a future bonanza hoped for by the projectors. There is a tendency among the shareholders to buy back what stock has been sold at as early a day as possible—stock having been sold for working purposes. If more should be sold to complete the tunnel it will be a limited amount and the chances are that the management will try and scoop it in again as soon as possible. C. R. Mayhew, a leading merchant, John F. Ellison, a prominent attorney, Drs. West and Westlake, John Wilson and Arthur Chittenden, all of Red Bluff, Tchama county, are the leading spirits and they go at the work in a practical, miner-like manner that deserves success. This tunnel is alongside of Tunnel 5 of the Central Pacific Railroad above Flat Creek District.

Backbone District.

Almost directly opposite Flat Creek District, on the left bank of the North Fork and the main branch of Squaw Creek, is Back-Bone Gold District. The entire district is a stratified belt of gold quartz veins carrying free gold, some of which runs very high. The formations are a quartzose porphyry. The district was gobbled up by a few men, and consequently but little work has been done in the way of development. Assays as high as $404 have been made. W. T. Coleman, of San Francisco, who has large interests in French Gulch and Deadwood, visited this district last week, and is reported as having purchased the J. W. Conant group of five mines, opposits the Windy Camp property. If such is the case, the speedy development of the district's resources can be looked for at an early day. Coleman has been instrumental in doing excellent work in this county, both for Coleman and the mining interests.

The Whittman and Small locations, adjoining the Conant group, are being developed, under a hond for $10,000, by Durhy Bros., of Oakland. The work, so far, has been highly satisfactory to the par ies interested. The mines of this district carry a great deal of sulphurets. The future of Back-Bone district is one of bright promise.

"Float."

Conroy's depot hotel is the mining exchange of the North.

Business men and professionals of Redding deal in mines.

Redding people talk mines and mining like well-versed me allurgists.

The Shasta county *Democrat* makes a specialty of mining news.

New-comers in search of mining property arrive in Shasta on every day's train.

A boom in milling interests is destined to follow up the prosperous condition of Shasta's mines.

J. N. Majors an old timer now a leading livery man is largely interested in Shasta county mines.

McCormack, Saeltzer & Co., one of Redding's leading business houses, have a branch house at Delta and carry a stock of $75,000.

Regular shipments of ore to Denver smelters are made from Redding; freight and treatment costing $50 per ton.

Copper City is enjoying a healthy boom and the plant now at work handles the ores successfully and profitably.

B. Conroy, mine host of the Redding Hotel, is a full fledged mining expert as well as a proverbially hospitable landlord.

Copley station is the shipping point for the Flat Creek and Backbone district mines; the fare from Redding to Copley is 60 cents.

The advertising Shasta is getting by her good mines is resulting in an increase of her population and an era of prosperity and plenty.

Miners in search of work by the day cannot find employment in any numbers in the districts described in this letter for some time to come.

B. B. Minor an experienced mining man is sojourning at Copley looking up good properties for himself and other capitalists. Mr. M. is considered authority on mining matters in that district.

F. W. S.

Mining Share Market.

Matters are quiet in the stock market, very little activity being apparent. Meantime, the never-ceasing, usual course of development goes right straight along in the principal points of the old Comstock lode, throughout its length of two miles, more or less, and the hopes of the situation are simply based upon actual developments at different points. The most interesting of all these has been the very encouraging prospect found in Hale & Norcross, on the 2,900 and 3,000 levels of that mine. A very acceptable quantity of excellent ore was developed, but not enough to justify extraction and milling at present. What more is to be developed at that particular point, the future alone can tell, but enough is already developed to show that a fine ore body exists in the 2,900 and 3,000 levels of the mine. It cannot be called a bonanza, but it is a first-class prospect for one. The flood which prevaded the mine for the last three or four weeks did considerable damage, giving a large amount of work in the way of cleaning out and repairing of drifts and timbering, and now the work has but just caught up to the point where it left off when the flood from the pump stopped operations.

The low grade bonanzas at both ends of the lode, in Consolidated California add Virginia and in Yellow Jacket, Crown Point and Belcher, are turning out their usual supply, with no sign of diminution, but rather of increase.

Bullion Shipments.

Silver Wave, May 27, $2,752; Richmond Con., May 26, $16,000; Christy, May 26, $1,400; Germania, May 26, $4,408; Hanauer, May 26, $2,650; Ontario, May 27, $23,264; Germania, May 27, $4,867; Hanauer, May 27, $7,450; Stormont, May 28, $3,450; Crescent, May 29, $1,800; Hanauer, May 28, $2,400; Germania, May 28, $5,000; Crescent, May 29, $2,600; Hanauer, May 29, $2,200; Germania, May 29, $5,319; Christy, May 29, $1,400; Orlano, May 29, $26,725; Hanauer, May 30, $4,400; Queen of the Hills, May 30, $1,400.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to anyone who does not wish it, but if t is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCA'N.	NO. SH.	AM'T. LEVIED.	DELINQ'NT. SALE.	SECRETARY.	PLACE OF BUSINESS
Alta S M Co.	Nevada.	32.	25.	Apr 30.	June 4	June 24. W H Watson. 302 Montgomery st
Baker Divide M Co.	California.	9.	25.	May 12.	June 15	July 6. D M Kent. 330 Pine st
Best & Belcher M Co.	Nevada.	32.	50.	June 2.	July 9	July 28. W Willis. 309 Montgomery st
Chollar M Co.	Nevada.	16.	50.	May 11.	June 24	July 15. C E Elliott. 309 Montgomery st
Con Imperial M Co.	Nevada.	22.	10.	May 20.	June 20	July 15. C L McCoy. 329 Pine st
Champion M Co.	California.	19.	08.	Apr 23.	June 1	June 19. T Wetzel. 328 Montgomery st
Caledonia M Co.	Dakota.	16.	15.	May 28.	July 10	Aug 5. W L Oliver. 328 Montgomery st
Eintracht Gravel M Co.	California.	18.	05.	May 26.	June 30	July 18. H Kunz. 209 Sansome st
Endowment M Co.	Nevada.	5.	50.	May 19.	June 22	July 20. E M Hale. 327 Pine st
Golden Fleece G M Co.	Ca ifornia.	1..20,000.	Apr 18.	June 8	June 27. F Schirmeier. Phelan Block
Gould & Curry M Co.	Nevada.	53.	40.	June 1.	July 8	July 29. A K Durbrow. 309 Montgomery st
Hale & Norcross S M Co.	Nevada.	85.	50.	May 6.	June 9	June 29. E B Holmes. 309 Montgomery st
Iowa M Co.	Nevada.	17.	05.	Apr 29.	June 6	June 27. C C Leavitt. 310 Battery st
Loreto M and M Co.	Mexico.	08.	15.	Apr 28.	May 29	June 22. H G Jones. 327 Pine st
Mexican M Co.	Nevada.	55.	20.	Apr 20.	May 23	June 13. G D Edwards. 414 California st
Navajo M Co.	Nevada.	11.	25.	May 25.	June 29	July 20. J W Pew. 310 Pine st
Overman S M Co.	Nevada.	55.	20.	Apr 20.	May 23	June 12. G D Edwards. 414 California st
Potosi M Co.	Nevada.	18.	30.	May 13.	June 19	July 10. C E Elliott. 309 Montgomery st
Pinal Con M Co.	Arizona.	6.	06.	Apr 10.	May 18	June 8. W Letts Oliver. 328 Montgomery st
Puget Sound Iron Co.	Wash Ter.	11.	50.	Apr 14.	May 25	June 25. A Halsey. 328 Montgomery st
Peerless M Co.	Arizona.	4.	50.	May 18.	June 23	July 17. A Waterman. 309 Montgomery st
Santa Anita M Co.	California.	8.	02.	Apr 23.	May 26	June 16. J M Buffington. 309 California st
Union Con M Co.	Nevada.	30.	25.	Apr 16.	May 20	June 9. J M Buffington. 309 California st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Alpha Con M Co.	Nevada.	W Wills.	309 Montgomery st.	Annual.	June 15
Bodie Con M Co.	California.	G W Sessions.	309 Montgomery st.	Annual.	June 15
Chalcedony Mfg Co.	Arizona.	I Adams.	318 Montgomery st.	Annual.	June 9
Goodshaw M Co.	California.	C C Harvey.	309 California st.	y. Annual.	June 9
New Era G M Co.	California.	A L Fuller.	413 Montgomery st.	Annual.	June 13

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Kossuth M Co.	Nevada.	C K Startevant.	328 Montgomery st.	06.	Mar 16
Mt Diablo M Co.	Nevada.	R W Heath.	318 Pine st.	20.	May 28
Navajo M Co.	Nevada.	J W Pew.	310 Pine st.	25.	Feb 13
Plymouth Con G M Co.		W Van Norden, Pres.	23 Nassau st, N Y.	50	Apr 6
Silver King M Co.	Arizona.	J Nash.	328 Montgomery st.	25.	Feb 16
Syndicate M Co.	Nevada.	J Stadfeld Jr.	419 California st.	10.	May 5

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING May 14.		WEEK ENDING May 21.		WEEK ENDING May 28.		WEEK ENDING June 4.	
Alpha	1.00	1.30	1.10	1.40	1.20	1.35	1.10	1.25
Alta	.20	.40	.20	.40	.30	.35	.30	.60
Andes	....	.60	.45	.60	.55	.65	.45	.50
Argenta	....	.10	....	.05	....	.15	....	....
Belcher	....	1.20	1.10	1.30	1.20	1.25	....	1.10
Belding	....	....	....	....	....	....	....	....
Best & Belcher	2.40	2.95	2.80	4.65	4.00	5.00	3.35	3.95
Bullion	.40	.50	.35	.40	.40	.45	....	.40
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	.20	.30	....	....	.25	....	....	.20
Bodie Con	1.30	1.50	1.50	1.60	1.40	1.45	1.40	1.55
Benton	....	.10	.10	.15	....	....	....	.10
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	....	.30	.30	.50	.40	.45	.40	.45
California	1.50	1.75	1.55	2.00	....	....	1.60	3.15
Challenge	.25	.30	....	.30	....	....	....	.25
Ohamplon	....	....	....	....	....	....	....	....
Chollar	1.20	2.50	1.50	2.35	2.10	2.50	1.80	2.45
Confidence	1.30	1.50	1.65	1.75	....	....	....	1.75
Con. Imperial	....	....	.15	.20	....	.10	....	.10
Con. Virginia	1.30	1.75	1.55	2.00	2.00	2.30	1.60	3.15
Con. Pacific	....	....	....	....	....	....	....	....
Crown Point	1.35	1.55	1.35	1.65	1.40	1.45	1.35	1.55
Day	....	....	....	....	....	....	....	....
Eureka Con	5.75	8.87	6.25	7.50	7.00	7.12	7.62	7.75
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	.35	.40	.35	.40	.35	.45	....	.30
Grand Prize	....	.75	....	.75	....	....	....	....
Gould & Curry	1.45	1.80	1.85	2.50	2.10	2.70	2.00	2.35
Goodshaw	....	....	....	....	....	....	....	....
Hale & Norcross	6.12	7.50	6.87	8.32	6.62	7.37	6.75	7.37
Holmes	....	4.00	....	4.30	4.50	4.75	1.75	4.75
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	.10	....	....	....	.15
Justice	....	.15	....	.15	....	.15	....	.15
Martin White	....	.40	....	....	....	....	....	....
Mono	1.15	1.40	1.20	1.25	1.05	1.25	.90	1.25
Mexican	.90	1.25	.90	1.30	1.25	1.45	1.05	1.25
Mt. Diablo	....	....	....	3.85	....	4.00	....	....
Northern Belle	....	....	....	....	....	....	....	....
Navajo	1.05	1.35	1.20	1.30	.90	1.25	.90	1.30
North Belle Isle	....	.15	....	.15	....	.15	....	.10
Occidental	1.50	2.00	....	1.40	1.55	1.70	....	1.50
Ophir	1.10	1.70	1.35	1.60	1.60	1.75	1.30	1.75
Overman	.15	.20	.20	.25	.35	.50	.20	.50
Potosi	.55	.95	.70	.95	.85	1.00	.70	.85
Pinal Con	....	....	....	....	....	....	....	....
Savage	2.90	3.65	3.60	4.10	3.85	4.15	3.60	4.20
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	1.15	1.40	1.15	1.60	1.35	1.60	1.20	1.40
Silver Hill	....	....	....	....	....	....	....	....
Silver King	....	....	....	3.00	....	....	....	3.00
Scorpion	.15	.20	.15	.25	.15	.25	.15	.20
Syndicate	....	.35	....	.40	....	.40	.30	.40
Tioga	....	....	....	....	....	....	....	....
Union Con	.70	1.00	1.10	1.40	1.25	1.50	1.15	1.40
Utah	1.75	2.25	1.75	2.00	1.60	2.00	....	....
Yellow Jacket	2.50	3.00	2.75	3.10	2.65	2.85	2.55	2.75
....	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY A. M., June 4.

250	Andes	10c	
150	Alta	50@55c	
550	B. & Belcher	.33@3.80	
50	Bulwer	45c	
225	Bodie Con	1.40	
500	Chollar	2.30	
525	Con Va & Cal.	2.70@2.75	
100	Exchequer	35c	
100	Grand Prize	70c	
100	Gould & Curry	2.15	
290	Hale & Nor	7.40@7.25	
200	Mexican	1.25	
20	Mono	1.10	
100	Navajo	90c	
860	Ophir	1.70@1.75	
300	Potosi	85c	
350	Savage	4.00@4.05	
330	Sierra Nevada	1.35	
290	Union	1.30@1.35	
100	Yellow Jacket	2.75	

Our Agents.

OUR FRIENDS can do much in ald of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

JARED C. HOAG—California.
J. J. BARTELL—Sacramento and San Joaquin Counties.
A. C. KNOX—San Louis Obispo and Santa Barbara Co.
G. W. INGALLS—Arizona.
M. S. PRIME—Alameda County.
MRS. OZIER—California.
E. L. RICHARDS—San Diego Co.
F. W. SMITH—Tehama, Shasta and Trinity Co.
W. B. TURNER—California.
L. J. SAFLEY—Alameda Co.
GEO. MCDOWELL—Fresno Co.

COMPLIMENTARY SAMPLES OF THIS PAPER are occasionally sent to parties connected with the interests specially represented in its colnmns. Persons so receiving copies are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its valumore widely known to othsrs, and extending its influence in ths cause it faithfully serves. Snbscription rate, $3 a year. Extra copies mailed for 10 cents, if ordered soon enough. Personal attention will be called to this (as well as other notices, at timss), by turning a leaf.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING MAY 26, 1885.

318,531.—WHIP SOCKET—C. L. Bird, San Buenaventura, Cal.

318,859.—DREDGING MACHINE—A. B. Bowers, S. F.

318,860.—DREDGING—A. B. Bowers, S. F.

318,596.—RABBETING CUTTER HEAD—P. A. Buel, Stockton, Cal.

318,544.—HORSE COLLAR—Wm. Cosbie, S. F.

318,454.—STICK CANDY MACHINE—J. J. Cousins, S. F.

318,890.—SASH PULLEY—J. D. Fyke, Los Angeles, Cal.

318,903.—SHANK STIFFENER FOR BOOTS, ETC.—A. Hummer, S. F.

318,623.—CONCRETE TUBE FOR CABLE R. R.—J. D. Isaacs, Oakland, Cal.

318,747.—WEDGE CUTTER—J. T. Jenkins, Clements, Cal.

318,563.—VINEYARD GANG-PLOW—R. B. Johnson, Fresno, Cal.

318,483.—FRUIT JAR—S. L. Loomis, Wright's Station, Cal.

318,572.—TRACE BUCKLE—O. Mallory, Auburn, Cal.

318,644.—HAY PRESS—S. H. Miller, Sacramento, Cal.

318,538.—STORM SHIELD AND OVERDRESS—Maggie Boyd, Riverside, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by telegraph or otherwise), at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

HORSE COLLAR.—Wm. Cosbie, S. F., No. 318,544, dated May 26, 1885. The invention consists in an improved metallic tuhuler throat-piece, the novelty of which lies in an elougated slot at the back crossed by ties near each end, whereby the piece is readily fitted to the rim. The edges or lips of the rim, together with the fly to which the belly is attached, project through the slot, and the tuhular piece is firmly held to place by the cross-ties. This tuhuler throat-piece is readily applied, and braces or shapes end strengthens the rim not only during the process of stuffing, but afterwards when in use.

COMBINED STORM SHIELD AND OVER DRESS.—Maggie Boyd, Riverside. No. 318,538. Dated May 26, 1885. This is a storm-shield, head umbrella and skirt protector adapted for ladies' use. It consists of a waist or body piece that shields the front and upper portion of the body, an umbrella shaped head piece, attached to or connected with said waist, and a skirt having a protecting fold or flap extending from the lower rear edge, so that it may be used to encase and protect the skirts of the wearer. The shoulder attachment may be raised or lowered to suit the position of the head-piece. The skirt portion drops over the ordinary clothing. The garment entirely encases the wearer and protects her from wind and rain.

VINEYARD GANG-PLOW.—Rasmus B. Johnson, Fresno. No. 318,563. Dated May 26, 1885. The invention consists in a simple and light frame of har iron carrying a plow on each side and hrought to a longitudinal center forward, where the clevis is attached, and in a single guiding, and adjusting wheel located centrally nnder the front of the frame and adapted to he adjusted hy a peculiar crank and lever. The object is to provide a light gang plow having a center draft and adapted to he easily halanced on a single wheel. The usual gang-plows have two wheels and their frames are not so constructed that a perfect center draft can be obtained; and this inventor claims that with the single wheel located under the front center of e properly centered frame he is enahled to properly construct a light and easily handled plow.

MAKING TULE BUNCHES FOR LIFE-PRESERVERS.—Constant Leduc, Stockton. No. 317,559. Dated May 12, 1885. This is a machine for making the hunches of tule-grass to he used in the formation of life-preservers. Mr. Leduc has already a patent on making life-preservers from the ordinary tule or rush that grows so plentifully in this State. The life-preserver is made up of a number of hunches of the dried stalks or stems of the tnle, end each hunch consists of a suitahle number of stems properly tied. The object of the present invention or machine is to make these hunches, and the invention consists in hed or die strips upon which the stems are laid in reciprocating or vertically moving presser-strips s dapted to he forced down upon the stems to press them into a bunch hetween themselves and the die-strips, and in swinging knives snitably arranged to cut the end of the hunch so that all the stems forming it are made of equal length. The invention further consists in the mechanism hy which the necessary movements are effected.

ADDRESS all correspondence to the name of the paper or firm, as either of the publishers or editors connected with the office are quite likely to be absent at times.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, June 4, 1885.

ANTIMONY—Per pound		@	—
Hallett's		12 @	—
Cookson's		13 @	—
BORAX—Refined		7 @	8½
IRON—Glengarnock ton		25 00 @	—
Eglinton, ton		23 50 @	—
American Soft, ton		27 00 @	—
Oregon Pig, ton		@	—
Clipper Gap, Nos. 1 & 4		25 00 @	30 00
Clay Lane White		26 00 @	—
Shotts, No. 1		26 00 @	—
STEEL—English, lb		16 @	25
Black Diamond, ordinary sizes		13 @	—
Plow		6 @	8
Machinery		10 @	12
Sanderson Bros		13 @	—
COPPER—			
Brazers' sizes		@	25
Fire-box sheets		28 @	—
Bolt		22 @	—
Yellow Metal		14 @	15
Ingot		14 @	15
LEAD—Pig		3½ @	3¾
Bar		5 @	—
Pipe		7 @	—
Shoot		8 @	—
Shot, discount 10% on 500 bag	Drop, ½ bag.	1 85 @	—
Buck, ½ bag		2 05 @	—
Chilled, do		2 25 @	—
TINPLATE—Oldcastle		5 25 @	6 00
Charcoal		5 75 @	6 75
Coke		5 25 @	6 50
Roofing		6 25 @	13 50
ZINC—German		9 @	10
Sheet, 7x3 ft, 7 to 10 lb, less the cask		9 @	10
QUICKSILVER—By the flask		33 50 @	—
Flasks, new		1 05 @	—
Flasks, old		85 @	—
NEW YORK PRICES—			
California Borax, refined		8 @	8½
Pig Iron, American		17 00 @	18 00
Quicksilver		41½ @	—
Lead		3 50 @	—
Copper		11½ @	—
Tin		18½ @	—
Bar Silver		1 06½ @	—

Satisfactory, Etc.

NOGALES, A. T., May 27, 1885.

MESSRS. DEWEY & CO., *Gents*:—Yours of the 18th of May enclosing notice of allowance of my application for a patent for "Process of Treatment of Nickel and Cobalt Ores," was duly received. It is extremely satisfactory, and I must say I am surprised at the rapidity with which you have accomplished a result which I expected would have taken six months or a year to reach.

Yours, very respectfully, C. H. AARON.

HELD FOR POSTAGE.—We repeatedly receive letters with the above stamped on them, showing that enterprising parties oftentimes forgot to put stamps on their letters. This may account occasionally, for the non-receipt of letters alleged to be sent to us.

HEREAFTER I shall confirm prices with the lowest in this market. C. Muller, optician, 135 Montgomery street, near Bush.

NOTICE TO ARCHITECTS.

$250 for Plans.

THE DIRECTORS OF THE INSANE ASYLUM OF Arizona propose to erect an asylum of sufficient size and capacity to accommodate 100 patients, near the City of Phœnix, in Maricopa county, Arizona Territory, and for the purpose of obtaining plans and specifications suitable for such an institution, hereby make the following offer to Architects, namely:

FIRST. The Directors will receive plans and specifications offered by Architects, and place on file with their Secretary, N. A. Morford, at Phœnix, Arizona, on or before the 3d day of July, 1885.

SECOND. On said day, or as soon thereafter as practicable, the Directors will examine all the plans and specifications offered, and if any one of them shall be approved by the Directors and adopted for the construction of said asylum, they will pay to the party offering the same, two hundred and fifty dollars; but the Directors reserve the right to reject all plans and specifications offered.

THIRD. The material to be used in the construction of the buildings will be brick, iron, and wood, unless some different material shall be found which is more desirable and which can be supplied for an equal cost.

FOURTH. The cost of the whole construction must not exceed $45,000.

FIFTH. The buildings must be complete in themselves, but so arranged that their capacity may be largely increased with facility by additions without changing or removing the structure.

SIXTH. The prices of material and labor at the site of the building will be approximately as follows, viz.:

Lumber per M., finishing and flooring	$65 00
Lumber per M., rough	45 00
Brick laid in wall, per M	14 00
Rockwork for basement, per perch	3 50
Iron, per lb	4c
Lime, per 1,000 lbs	2 00
WAGES. Carpenters, per day	4 00
Bricklayers, per day	5 00
Laborers, per day	2 00
Painter, per day	4 00
Plasterer, per day	5 00

SEVENTH. The climate is temperate, but the mercury ranges high during about three months of the year, and then it drops to the freezing point in winter, occasionally, and hence provisions must be made against extremely warm as well as cold weather. The temperature ranges approximately as follows:

	Maximum, Means for 1884.	Minimum, Means for 1884.
January	70.1	31.1
February	70.5	34.5
March	76.1	32.9
April	85.2	40.8
May	93.4	40.1
June	103.4	55.7
July	109.0	64.3
August	104.2	63.2
September	89.0	48.3
October	93.0	51.3
November	83.2	40.1
December	67.8	36.1

All plans and specifications sent by mail or express must be prepaid and marked "Plans and Specifications for an Insane Asylum," and addressed to the Secretary of the Directors of the Insane Asylum, Phœnix, Maricopa County, Arizona.

Plans and Specifications will be returned, if required, on receipt of cost of transportation. N. A. MORFORD, Sec'y Board of Insane Asylum Directors.

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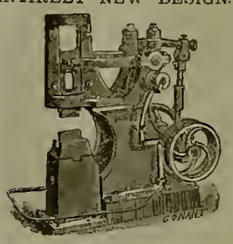

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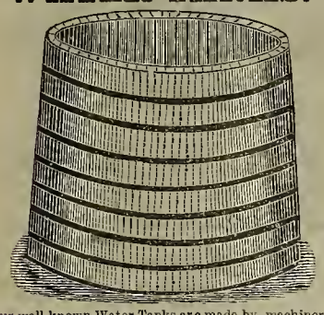

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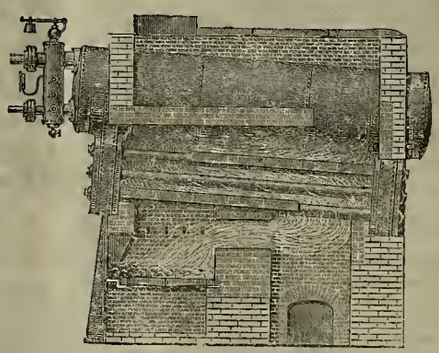

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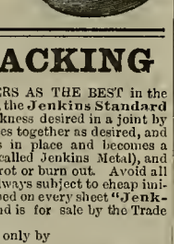

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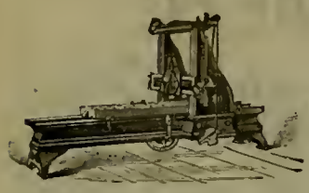

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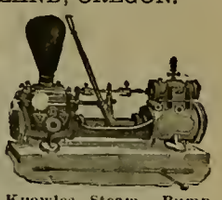

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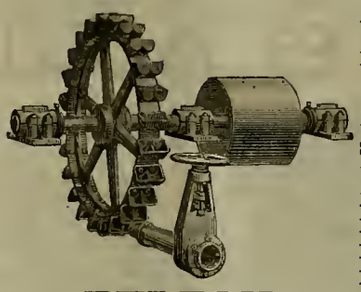

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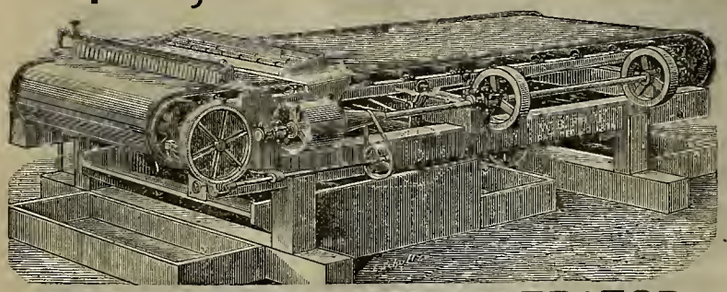

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The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement on patents owned by them.

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N. B.—We are and have been ready at any time to make a competitive trial against the Triumph, or any other Concentrator for stakes of $1,000.

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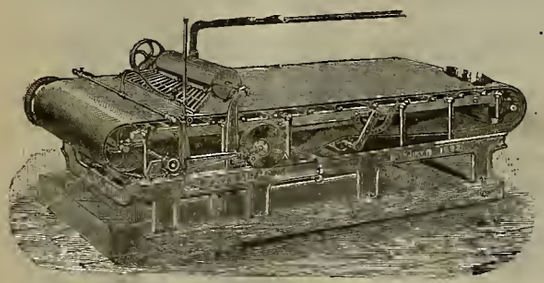

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These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with a curate deductions therefrom, will soon be published in Circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and **we hereby accept the Challenge of $1,000,** flaunted by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

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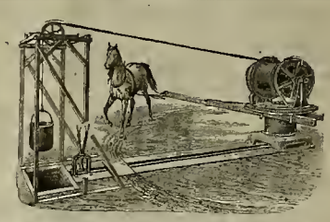

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MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO, SATURDAY, JUNE 13, 1885.

VOLUME XLXX
Number 24.

Shaft Sinking.

[*Continued from our last.*]

This latter rope, on its way to the gear-wheel, passed over a rolling horizontal drum (P, Fig. 1, and A, Figs. 12, 13, 14), and between two vertical rollers (B, Figs. 12 and 13). The drum could be moved forward by a winch (Q, Fig. 1), and run back by a weight (R, Fig. 1), and the vertical rollers could be moved to right or left by a screw (C, Figs. 12, 13 and 14), and so the point of suspension of the tools could be placed over any part of the floor of the shaft where the drill-pump was to work.

The hoisting frame and machinery were the same that were put in and are now used for ordinary hoisting and pumping, except that for pumping a larger gear-wheel has been put in the place of the one which imparted drill motion to the tools. The winding reel (S, Fig. 1), was operated by friction gear in raising the tools and load, and controlled by break in lowering them.

The tools were let down and the connecting rope attached by the clamp La, Fig. 1, and put into place by moving the drum and rollers; the main rope slackened above the clamp and the machinery started, giving the lift and drop motion to the tools. When the drill-pump was loaded the connecting rope was unclamped from the main rope and disconnected with the driving wheel by slipping the wooden eye from the wrist pin, the drum moved back, the tools raised and the drill-pump emptied.

The drill-pump and its parts are shown at G, Fig. 1, and in Figs. 2, 3 and 4 (in PRESS last week). The whole length of the pump is 7 feet and 7 inches (D, Figs. 2, 3 and 4), which extends 10½ inches above the head. The main barrel, A, Figs. 2, 3, is wrought-iron one-fourth inch thick, with welded vertical seam, is 7 feet 1 inch long, and its inside diameter is 1 foot. The shoe (B, Figs. 2, 3, 4), screws on to the barrel at its lower end. Its cutting edge is formed by a beveled steel ring (Ba, Figs. 2, 3, 4), which is fastened with set screws to the iron of the shoe.

The valve seat (F) is held in place by a projection (Ea, Fig. 3) at its lower edge, placed between the shoe and the lower edge of the main barrel. The head (C, Fig. 3) consists of a wrought-iron plate, three inches thick, held to the barrel by a band (F, Fig. 3) screwed on to it and on the outside of the barrel. The joint was made more firm by shrinking an iron ring (G, Figs. 2, 3, 4) on to the band over the edge of the plate of wrought-iron; and to make the joint more secure, a similar wrought-iron plate should be put into the upper end of the barrel, and a ring shrunk on to the band over its edge.

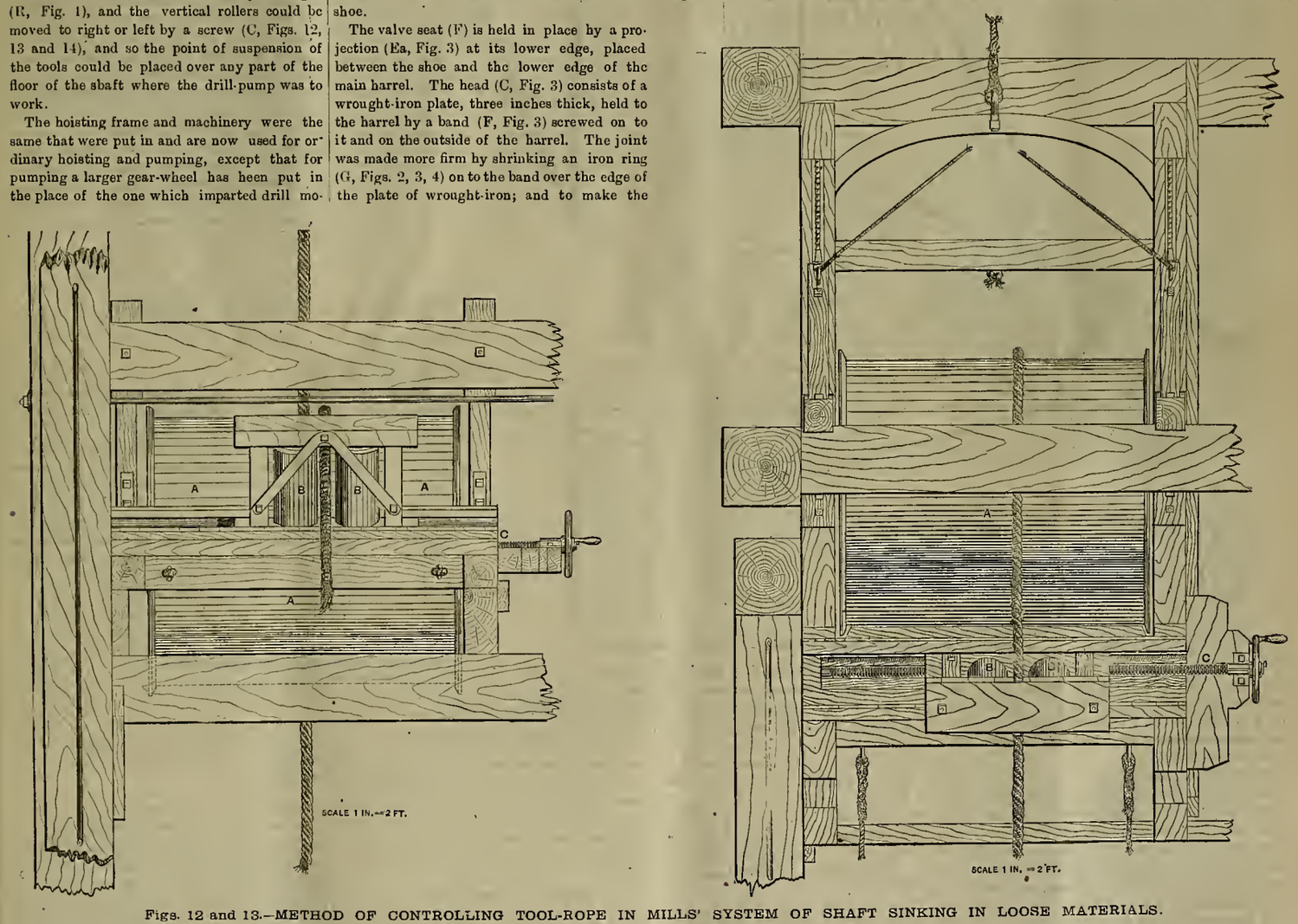
The pin (D, Figs. 2, 3, 4) by which the drill-pump is attached to the auger stem, is screwed into the iron plate of the head, as shown in Fig. 3. An opening (H, Figs. 1 and 4) below the head let out the air as the drill-pump descended into the shaft, and the water above the load during the drilling. The load was taken out of the barrel shoe through the opening (I, Fig. 4) just over the with a small hoe made for the purpose. The opening was closed by the gate (J, Figs. 2, 3, 4). To prevent hitting the butt-straps of the caisson with the sharp edge of the shoe and the upper edge of the pump, the guard of wood and iron (K, Fig. 4) was put on. The weight of the tools as suspended was as follows:

	Lbs.
Pump	872½
Augur-stem	672
Jars	384
Sinker-bar	438
Rope-socket	54
Total	2,440

To this must be added the weight of the rope, which increased with the depth. But the weight of the rope, rope-socket, sinker-bar and upper link of the jars added nothing directly to the force of the downward blow, and, aided it only by overcoming the friction of the rope in passing through the water. In fact the sinker-bar was omitted for the greater part of the distance, but toward the last seemed to be of some service, especially when the water was thick with mud. The wood of the pump guard weighed about 72½ pounds when water-soaked, not far from the weight of the water it displaced, and neither increased nor lessened the force of the blow materially. There remained of the pump 800 pounds of iron, which, with the 692 lbs. of the augur-stem and the 193 pounds of the lower link of the jars, made a weight of iron 1,690 pounds. This, falling through water, is equal to 1,472 pounds falling through the air, with some deduction to be made for the difference between the frictional resistance of air and water, and some further deduction for the greater weight and frictional resistance of the water when heavily charged with mud in suspension. The weight and consequent force of the blow increased as the pump became loaded, and at times the weight reached nearly the equivalent of a ton falling through air. The lift and drop of the tools when drilling which was found best fitted for safe and efficient working of the machinery was 2 feet, and the number of drops 32 per minute.

When the drilling was going on a man stood with his hand at the temper-screw to let down the tools by turning the screw as the drill-pump excavated, fast enough to render the blow effective, but not enough to permit the tools to topple over against the caisson. He could judge of the blow by the jar at his hand.

The length of time required to load the drill-pump varied with the character and compactness of the material, but it was generally kept in motion at the bottom 20 minutes. The raising and lowering, connecting and disconnecting at the clamp and wrist-pin, taking out the gate and the load, and replacing the gate, took about 10 minutes more, making 30 minutes to each



Figs. 12 and 13.—METHOD OF CONTROLLING TOOL-ROPE IN MILLS' SYSTEM OF SHAFT SINKING IN LOOSE MATERIALS.

oharge, or two charges to the hour. The area of the cross-section of the caisson, including its wall, is 16.5 square feet, and the area of cross-section of the drill pump 0.785 of a foot, or ahout one and one-twenty-first of that of the caisson. The matsrial in ths drill pump was less compact than in place at the hottom of the shaft. A load of 1 foot in depth in the drill pump would lower the bottom of the shaft ahout one-half inch, and a load—quite oftcn attained—of 4 feet in depth of the drill pump would lower the hottom of the shaft two inches, and 20 such loads in a day of 10 hours would lower it 40 inchss. The latter rate of sinking was somstimes attained, hut the average rats was much lower.

The caisson was put into the rectangular shaft A, Fig. 1, which bad already heensunk 14 feet, and the space outside of the caisson and within the rectangular shaft filled with clay. The only settling ahout the shaft observahle at the surface, was within the reotangular shaft. It was hut little, and as it took plaoe, clay was added at the top.

Before the work was fairly started, some days had heen spent in hecoming accustomed to the work and making needed alterations in the tools; and during this time the caisson had heen sunk five feet, or to 19 feet from the surface. The shaft and caisson were sunk the next 59.6 feet, or to 78.6 feet helow the surface, in 41 working days of ten hours each, or at the rate of 1.45 feet per day. This included the time spent in putting on new sections to the caisson, whicb was 13.6 days.

At this depth (78.6 feet helow surface), the water was taken out of the shaft. The material passed through had become more compact from ahout 60 feet downward, and I had expected to sink from here hy ordinary methods; hut the inflow of water at the hottom, which was at first 3.2 cuhic feet a minute, increased in ahout four hours to 5.3 cubic feet per minute, and it was plainly hest to continue on with the method that had succeeded so well thus far. The caisson was in good condition, whole and water-tight, hut slightly curved from end to end, so that the center at the bottom was ahout 4⅜ inches from a plumb-line dropped from the center at the top.

After a delay of some months in gettiug more sections of caisson, work was resnmed, and the shaft was excavated and the caisson sunk 102.4 feet further, or to 181 feet helow natural surface in 91 days of ten hours each, actually spent upon the work. This included 22½ days spent in putting on new sections of caisson.

To this point the working force consisted of one skilled man to tend the engine, and two skilled drillers, and one or two lahorers a portion of the time to aid at the screws, hesides the engineer in oharge. The working time was limited to ten hours a day, hecause the work was novel and it seemed hardly safe to have it go on in my ahsence, and also hscauss I wished to ohserve carefully the character of the deposits passed through. The principal danger was that the excavations might he carried too far ahead of the caisson, and so cause caving and loosening of the material ahout the caisson. This would he ohviated if hydraulic presses were suhstituted for screws as ahove suggested.

At the depth now reached (181 feet), the effeot of the curve in the shaft hegan to be seriously felt; for tbe drill-pump hanging vertically from the top could not he made to drop ou to all parts of the floor, and left untouched a crescent-shaped area under the over-hanging portion of the cylinders. The material thus left had to hs partly caved in and partly crowded in hy incrsased pressure on the caisson. The force at the screws was increased, and consisted at timss of six men; and a few weeks later the pressure of the screws was reinforced hy hlows of a ram consisting of a stick of timher of 21 inches square and 22½ feet long, weighing, with eye-holt, nut and washer hy which it was suspended, 2,280 ponnds. This was dropped two feet, 30 times a minute, on to a timher placed hetween the timhers on which the screws acted directly and the upper edge of the caisson.

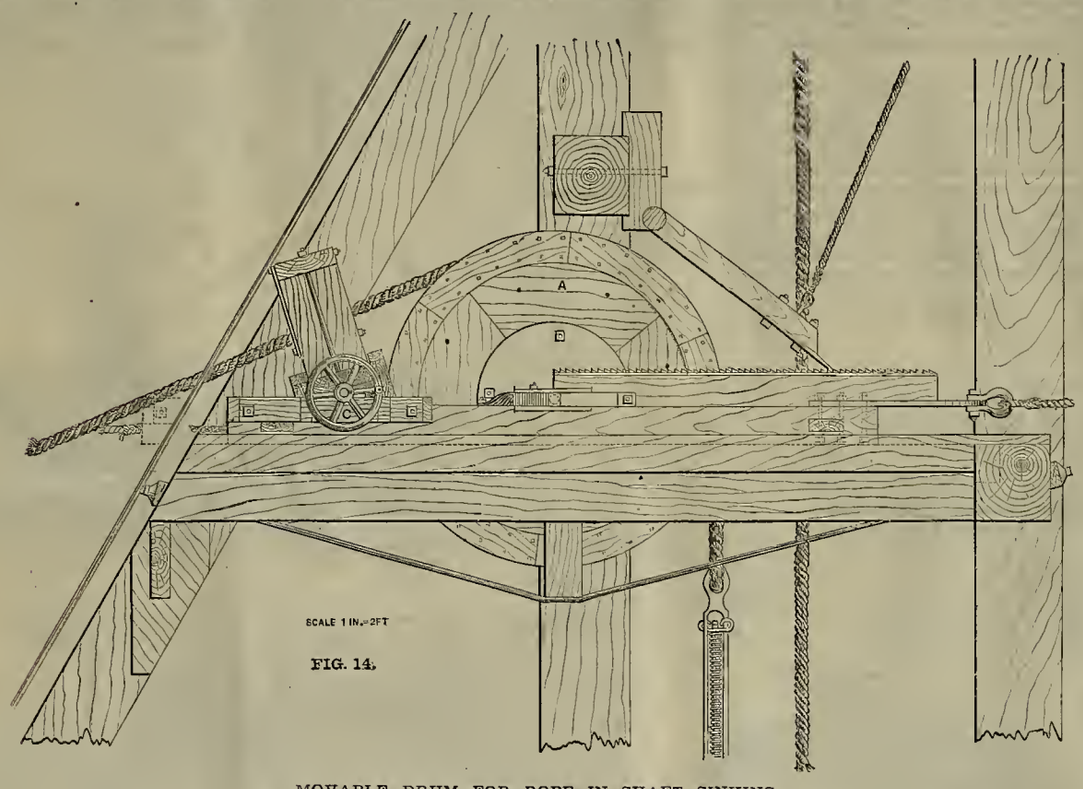


FIG. 14.

MOVABLE DRUM FOR ROPE IN SHAFT SINKING.

Including the time consumed in putting on the ram, and putting on new sections, it took 23.5 days to sink the caisson the next 15.5 feet, to the depth of 196.5 feet helow the surface. The excavation was 5.7 feet deeper.

The water was then again hailed out of the shaft. The curve of the shaft now left nearly half of the floor outside of the direct blow of the drill pump, and in the area thus out of reach were houlders of hard material and flattened shape, one of which was 0.44 cuhic foot in hulk. These materials on the higher part of the floor were cut down by hand and thrown to the other side where the drill pump could reach them, and then taken out hy the drill pump. In all, ahout four hours of time was spent in excavating hy hand, and this was all the excavating done hy hand in sinking the shaft.

At the lower edge the shoe showed a slight hulge, extending over ahout nine square inches of area, and projecting inwards about one-half inch at the middle of the bulge. Otherwise the caisson was unimpaired.

The iuflow of water was varying, hut at first averaged ahout 1.21 cuhic feet per minute, and increased to ahout 2.34 cuhic feet.

The next 13.5 feet hrought the caisson to tbe surface of the hed-rock, at 210 feet below the natural surface. It took 23 days, including the time (4 days) spent in putting on two sections of caisson.

The bed-rock was a friable and rather soft clay slate, and was easily excavated with ths drill-pump. The caisson was sunk 20.7 feet in the hed-rock, to the depth of 230.7 feet helow natural surface. To sink this 20.7 feet in hedrock took 46 working days, including all the time of excavating, pressing caisson and putting on the sections of caisson.

After a month's delay the water was hailed out of the sbaft. The caisson was in good condition, hut somewhat deformed at its lower edge—not enough, however, to materially impair its usefuluess. I think this deformation was caused hy the hed-rock swelling and pressing against it unevenly.

The inflow of water varied, hut averaged ahout 3.6 cuhic feet per minuts, or less than 5½ per cent of the inflow at 14 fset from the surface. It came through the hed-rock clear, and was therefore not enlarging its channels.

The shaft had not only heen sunk successfully through 210 feet of loose materials and 20.7 feet of rock, hut the caisson had shut out the water of the upper loose gravels and sands and of the lower layers of similar materials, had prevented the running in of sand, and left, to he contended with at the hottom, only a small inflow of clear water coming through rock.

A partition with ladder attached was put in, as shown in Fig. 15 (see page 381), dividing the shaft into hoisting and pumping compartments, and a common "jack head" pump, of five inches diameter and four feet stroke, was carried down at the same time with the partition.

A portion of the hed-rock was found loose and running, and where it was so, rods of round iron, one inch in diameter and three feet long, were driven into the rock through holes drilled through the shoe, two inches ahove its lower edge, and two inches apart from center to center, and into the hed-rock as far as the rods were to go.

The shaft was theu sunk hy hand four feet helow the lower edge of the shoe for a sump, and secured hy staves driven around iron hoops. The staves were started ahout a temporary hoop of outside diameter three inches less than the inside diameter of the shoe, hut the other hoops have the same inside diameter as the caisson, and when the staves were all in they were pushed outward and upward hy the outer surface of the shoe, so as to rest against it at their upper ends.

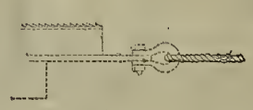
A row of iron rods like those hefore mentioned was driven over the space where the opening for the drift or gallery was to he made, and just above the second butt-strap, counting from the hottom. The opening was cut out through the caisson hetween the lower edge of this butt-strap, and the upper edge of the shoe. The plan of the opening and the timhers at the heginning of the drift are given in Fig. 16 (see page 381.)

As long as tbe work is one of exploration, kihhles will answer for hoisting; hut, when necessary, a cage can he used to occupy the whole cross section of the hoisting apartmsnt, aud when still more hoisting room is needed, another shaft can he sunk near hy, and one of the two given up wholly to hoisting, and the other left for pump, ladder-way and ventilating pipes; and, indeed, the capacity can hs increased, to any required extent, by sinking a group of such shafts near one another, hut with space enough hetwesn thsm to prevent hreaking down or disturbing the ground hetween them while sinking. Shafts much larger than the one here described, indeed, of any ordinary size, could be sunk hy the same method.

All the serious difficulty which this methodof sinking encountered was caused hy the curve of the caisson; and this is an unavoidahls difficnlty. The nse of hydraulic presses, as ahove suggested, wonld ohviate the danger of excavating too far below the foot of the caisson, and would reduce the working force to three skilled hands.

The method is not only an efficient one where ordinary methods would fail, but it is also an economical, rapid and safe method of sinking through water-hearing, loose matsrials, and could he applied to sinking caissons for hridge piers and other foundations, as well as to mining shafts and large artesian wells.

I have given above the time actually spsnt in sinking. The work was not, however, dons continuously, hut in intervals of time spent partly in waiting for new sections of caisson to he made aud transported to the ground, hut principally caused hy delay in ordering them. The drilling hegan August 21, 1882, and ended November 29, 1883. The tools wers contracted for in March, 1882, and at the same time 80 feet in length of the caisson, with shoe, screws, etc. The remaining sections of caisson were ordered in several lots. The reason for not obtaining enough to go to the hottom after the experiens



of a few feet had proved the efficiency of the excavating tools, was the lack of data for judging of the friction to be encountered.

If the caisson had heen perfectly vertical, I could now present definite data for determining the friction to he overcome under similar conditions; hut on account of the curve in the shaft the necessary friction on the onter surface of the caisson cannot he separated from the added resistance of the materials at the hottom which were not reached directly hy the drill pump, and I can therefore add little on the suhject to what is ahove shown, namely, that to the depth of 230 feet the friction on the outer surface of such a caisson carried through such materials is overcome with a pressure easily applied and safely within the endurance of a wrought-iron cylinder, having the thickness of iron proportioned to area of its cross-section as in the one ahove described, and having a shoe of rolled steel, proportioned as the one described.

MINING DECISION.—Secretary Lamar bas issued an order of interest to miners everywhere on the public domain. On December 4, 1884, while thousands of mining claims were pending, an order was made hy Secretary Teller that in applications for lode claims, where the survey conflicts with a prior claim and the ground in conflict is excluded, the applicant not only has no right to the excluded ground hut he has no right to that portion of any vein or lode the top or apex of which lies within such excluded ground, unless the location was prior to May 10, 1872. The order now made puts things hack just where they were before Mr. Teller's order was issued, as follows: In entries made prior to the receipt hy the register and receiver of the circular of Decemher, 1884, the survey, if free from objection under the former practice, need not he amended to conform to the provisions of paragraph 2 of said oircular. All deoisions under said circular in conflict with the foregoing may to that extent he recalled.

SEVERAL prospectors from New River arrived in town last Friday broke. They say they did not find the new camp what they were led to helieve hy newspaper reports, hut notwithstanding their hard luck tbey speak well of the country, and helieve that several good mines will be developed there.—*Shasta Co. Democrat.*

MECHANICAL PROGRESS.

The Effect of Oil in Boilers.

Ths Hartford Steam Boiler and Inspection o. have recently published the particulars of ie peculiar effect which oil applied to the in- rior of a boiler may have upon the same. In e case in question the boiler had been cleaned Sunday, and at that time a gallon or mors "black oil" had been thrown into it. On onday morning the boiler was fired up, and n through the day at a pressure of 90 pounds. ie engine was stopped at 6 o'clock P. M. and ain fired up at 9 o'clock the same evening. hile firing up a large bulge or projection was served on the plate directly over the fire; the mensions of which were four feet lengthwise d three feet girthwise. The metal, originally s-third of an inch in thickness was drawn wn to one-eighth without fracture—proving at the iron was very superior.

Ths expert exeminer employed by the com- ny roported that ths bulging was undoubtedly e to ths presence of the oil or grease in the iler. The explanation was given as follows: ie grease settles down on ths fire sheets, nen the draft is closed and the circulation of ter nearly stops—thus contact between the ate and water is prevented, and as a conse- ence the pletes become overheated, under nich circumstances a comparatively low pres- re will be sufficient to bnlge the sbects so ated.

The advics given was that when oil is used remove scale too much care cennot be used maks sure that it is free from greese or ani- l oil. Nothing but pure mineral oil should used. It should be borns in mind that crude troleum is one thing; black oil, which may an almost enything, is very likely to he mething quite different.

The action of grease in a boiler is peculiar. does not dissolve in the water, nor does it compose, neither does it remain on the top of e weter, but seems to form itself into what ay be termed "slugs," which et first seem bs slightly lighter than water. After a ort season of boiling these slugs or suspended ops seem to ecquire a certain degree of sticki- ss, so that when they ars brought into con- ct with the shell and flues of the boiler (as ey ars carried about by the circulation of s water) they hegin to adhere thereto. nen under the process of heat they begin e process of. "varnishing" the interior of e boiler. And it has been found, says the port, that "the thinnest possible coating of is varnish is sufficient to bring about over- eating of the plates."

The time when damage is most likely to cur is after ths fires are hanked, for then the rmation of steam being checked, the circula- on of water stops, and the grease thus bas an portunity to settle on the bottom of the iler and prevent contact of the water with ie fire sheets. Under these circumstances, a ry low degree of heat in the furnece or pres- re in ths boiler is sufficient to overbeat the ates end cause bulging.

It was probably between the hours of 6 and o'clock P. M., while the fires were hanked, nd the pressure only 40 pounds that the bulg- g took place in the boiler which has furnished is facts for this article.

Bisulphide of Carbon Again.

The Middlesex Electric Light Company of owell has just built and put in operation at eir works in that city a bisulphide of carbon ngine—or as it has been sometimes called "the riple thermic motor." Quite a little excite- ient it will be recollected was caused by the ttempt to put to practical use one of hese engines about a year ago. The experi- ient proved a failure by reason of the impossi- ility of making tight joints. In spite of all fforts to retain the gas it would escape in such uantities as to make its presence unbearable, not decidedly dangerous to life. There is no uestion in regard to the great economy of the se bisnlpbur of carbon if its use can also be ade practicable. In the use of this gas the isulphide is vaporized by steam, and not by omediate application of fire. The boilere and ipes conveying bisulphide vapor are all encased other boilers and pipes containing hot steam. s this agent attacks all oils, the lubricant ed is pulverized plumbago, which is euspend- l in a liquid, the composition of which is nown only to the inventors. The machine nsists of two 24-horse-power steam boilers, o large bisulphide boilere of a capacity of 500 unds of bisulphide liquid each, and an ordinary gine of Fitchburg manufacture, of 170 horse- wer. At the preliminary trial which took ace some three weeks since, a small wood fire as built under one of the steam boilers, and hen the engine was started the steam gauge dicated a pressure of 30 pounds, while the sulphide gauge showed 60 pounds. There was rface pressure of two pounds. The engine rted slowly and was kept at uniform speed, l the engineer again turned the valve and in- eased the revolutions to a great velocity. nen it was slackened at the engineer's will, d the whole machine seemed to be under st perfect control. Profs. Trowbridge, of Harvard, Trowbridge, of Columbia, and Rich- ards, of Yale are expected in Lowell before long to make a scientific test of the new engine."

Much interest is felt for the forthcoming re- port of the eminent gentlemen named, on ths practicability of this new motive power. Its success would work an important revolution in ths use of steam.

Steel for Structural Purposes.

The growing quantity of steel used for structurel purposes has attracted some etten- tion. One of the largest, if not the largest, works in the country is steadily increasing its make of steel, while it is more and more de- parting from the use of wrought-iron, and other establishments which were producing steel exclusively for railroad purposes are turn- ing to the manufacture of structural shapes. An animated discussion of ths relative value of the two materials may therefore be looked for- ward to at an early date. An argument is now being heard which will probably grow in favor with the supporters of wrought-iron for beams, for instance. It is urged that the duty of a beam is to maintain absolute rigidity; that the material of which it is composed is not to be subjected to stresses taxing its final tensile strength. Any material, whether it be iron or steel, can sustain certain loads before the slightest changes in its external form takes place. The effect of strains up to that point will be a state of intermolecular tension, which to a certain degree even the slightest load pro- duces. It is held that ths value of a material which is to be used as a beam depends upon the load which it can carry before that intermolecu- lar tension has reached a point where it finds expression in the first evidence of deflection. It is argued that it is not so much the mechanical resistance of the material to loads after that point has been reached as the preliminary or intermolecular tension a material will hear which determines its value as a beam. It is argued that the efficiency of a beam in this re- spect is proportional rather to its mess than to the mechanical qualities of the material, and thet, therefore, it is misleading to claim that because steel has a higher tensile strength a smaller weight will bear ths same loads before deflection sets in. The rigidity of a beam, therefore, depends not so much upon the quality of the material, but upon its mass.—*Boston Journal of Commerce.*

Kerosene in Boilers.

In regard to the value of kerosene or mineral oil for boilers, we append the following item of experience recently furnished by a corres- pondent of the Boston *Journal of Commerce:*

"Several years ago the writer was engaged to take charge of a steam plant in what is known as the alkali region. The water was so impregnated with minerals that is was next to impossible to keep boilers in passable condition, and many were ruined before they had been in service two years. This plant had been in operation only three months, yet the deposit in the boilers was, to our unaccustomed eyes and experience, very heavy. All kinds of scale ex- terminators were used, but to no purpose. At length, in desperation, while cleaning boilers, we took kerosene oil and thoroughly saturated the scale with it and let the boilers stand until the scale had absorbed all the oil before filling with water. After two weeks' run the boilers were emptied for cleaning. Upon taking off the hand-hole plates we found the bottom of the boilers covered with detached scale. The tubes looked as though they were just recover- ing from an attack of small-pox, while the scale which still adhered to them could easily be re- moved. We again wet the heads and other spots where the deposit had not been removed with oil. The next run was of four weeks' duration—just twice those before—and when we cleaned them we found clean boilers. After that boilers were only emptied once in six weeks. Our success has induced other engineers to try kerosene, and their trials always proved successful. After considering the matter, we arranged so as to be able to in- ject the oil in small quantities while the boilers were in use, and after that will give them about one quart per week to each boiler that was 5 feet diameter by 18 feet long. Kerosene must be used with judgment, for too much will un- doubtedly ruin a boiler. The amount needed to do the work is very little. I will state that the above happened in 1875, and that same battery is in use to-day and in good condition, and that the average life of a boiler in that region heretofore has been about five years."

WATER IN STEAM.—Herr Stoupler, of Lu- cerne, Switzerland, by adding fluorescine to the water of a boiler, which by calorimetric test enabled him to detect the presence of one-half of the one per cent of water carried mechanic- ally out of the boiler by the steam, found that from two, three to four per cent was actually thus present in the steam. The deep green color of the water in the boiler was retained in it for weeks, and yet no trace of coloring could be detected in the water condensed in the steam cylinder, a proof that the water which gathers there is entirely due to condensation caused by the expansion of steam, and that very little water is actually mechanically car- ried away by the steam from boilers.

SCIENTIFIC PROGRESS.

The Cause of Storms.

Storms are caused by a strong and extensive upward motion of the air, by which means its vapor is condensed by the cold of elevation. The atmosphere receives heat from the sun, and loses heat by radiation. One-fourth of the rays of the sun are absorbed in passing verti- cally through the atmosphere. The remaining three-fourths are absorbed by the earth's sur- face, by which means its temperature is raised, and heat is thence communicated to the air which rests upon the earth. The atmosphere thus receives its heat chiefly at the bottom, and in consequence of radiation loses it most rapidly at the top. The density of the air is dimin- ished by an increase of heat. The atmosphere is in a state of unstable equilibrium, and the lower strata tend continually to rise and take the place of the upper. Such ascending cur- rents are formed on every tranquil day. As the air ascends it comes under diminished pres- sure and expands. As it expands it cools at the rate of about 38 degrees for two miles of ascent. This ascending air carries with it the vapor which it contained at the earth's surface, and if it rises high enough, the cold produced by expansion will condense a portion of this vapor into cloud. The hight to which air must ascend before it will be cold enough to form cloud depends upon the difference between the dew-point and the temperature of the air. If the dew-point be 10 degrees below the temper- ature of the air, cloud will begin to form when the ascending current has risen about 1,500 feet.

Winter Storms

Commence gradually, and generally attain their greatest violence only after a lapse of several days. After a certain period their violence gradually diminishes, and at length they disap- pear entirely. This succession of changes re- quires a period of several days. Sometimes one or two weeks or longer. Occasionally all these changes are experienced over the same country; that is, the storm makes no progress from place to place. More commonly the storm travels along the earth's surface, and although the same storm may continue for one or two weeks, or even longer, its duration at any one place may not exceed one or two days. Throughout the middle latitudes of this continent, where violent storms advance with considerable rapidity, the direction of progress is always from west to east. The rate of progress of storms varies from zero to 44 miles per hour. They generally travel from St. Louis to New York in about 24 hours, and from New York to Newfoundland in another 24 hours. While they advance steadily eastward the wind has every possible direction at different places within the limits of the storm. At places on the north side of the center of a great storm the wind generally sets in from the north of east as the storm approaches, as the storm passes by the wind changes to the northwest, backing round to ths north point. At places on the south side of the center of the storm the wind generally sets in from the south of east as the storm approaches; as ths storm passes by, the wind changes to the southwest, veering round by the south point; ths latter is exactly what takes place here in the Sacramento valley, which is an evidence that the storm's center is to the north of California, and that we are al- ways on the south side of the storm's center. If the storm's center passed to the south of us we would have mostly snow in winter instead of rain, for in that case the wind would be northeast in advance of the storm, and as the storm passes the wind would back to north and then northwest; and those winds being cold winds, we would have snow. The snow we had a year ago last winter was from storms, whose center passed south of the Sacramento valley.

An Interesting Experiment.

In a portion of *La Nature* commonly devoted to the illustration and description of physical phenomena, which may he produced without special apparatus, and are, consequently, of peculiar interest in respect of the demonstra- tion of principles in the lecture room, etc., there were recently published directions for the production of illuminating gas from paper. In the first place, the general effect of carboniza- tion is to be shown by burning, upon a clean, dry porcelain plate, a piece of white paper the size of the hand. The white paper not only be- comes a black mass, but also underneath the thin carbon will be found a yellowish stain upon the plate, which is due to the condensation of the residual products of the carbonization of paper. There has been, in fact, besides the free inflammation of the gases of the paper upon their contact with the air, a process of distillation and condensation from the same gases as developed from the under side of the paper, which is less accessible by the air. In order to show that gas is really devolved in this way, a sheet of stout wrapping-paper may he twisted into a cone, with an open end. The point of the cone is then to be held in one hand, the open base being inclined downward at an angle of about 45 degrees. A small hole is to be made in the upper part of the cone, near the apex; and the paper is then to be ignited at the base. As it burns, a true distillation goes on in the interior of the cone, and the gases escape from the small hole at the top, where they may be ignited. The demonstration is, of course, very brief, for the paper consumes soon burnt; but it is sufficient to prove how illuminating gas is produced by the distillation of organic matter in closed vessels. A little practice will give the necessary facilities in handling the burning cone, so as to give the gas time to form and escape under sufficient pressure from the hole made for the purpose.

THE AIR AND THE TELESCOPE.—The astrono- mer, in viewing the heavenly bodies constantly, labors under great disadvantage, both from the effect which the air exerts upon the telescope and that which the instrument has upon the at- mosphere, through which he is looking. The air, says a writer, is his enemy in two ways. Part of the light which brings its wonderful, evanescent messages across inconceivable depths of space it stops; and when it does not stop, it shatters. And this even when it is most trans- parent and seemingly still; when mist veils are withdrawn, and no clouds curtain the sky.

Moreover, the evil grows with the power of the instrument. Atmospheric troubles are magnified neither more nor less than the ob- jects viewed across them. Thus Lord Rosse's giant reflector possesses—nominally—a magni- fying power of 6,000; that is to say, it can re- duce the apparent distances of the heavenly bodies to one six-thousandth under their actual amount. The moon, for example, which is in reality separated from the earth's surface by an interval of about 234,000 miles, is shown as if removed only 39 miles. Unfortunately, how- ever, in theory only. Professor Newcomb compares the sight obtained under such cir- cumstances to a glimpse through several yards of running water, and doubts whether our satel- lite has ever been seen to such advantage as it would be if brought—substantially, not merely optically—within 500 miles of the unassisted eye.

A SELF-CONTAINED ELECTRIC LAMP.—Recent experiments have been made in electric light- ing to make each lamp contain its own battery, and have succeeded perfectly. This success has been affected by means of the Skrivanoff pri- mary battery, the elements of which consist of a small packet of chloride of silver and two plates of zinc placed in the cell with a weak so- lution of caustic potash. A small battery is placed in the stand of a moderator or other similar kind of lamp, which can thus be utilized for the purpose, a glow-lamp being fixed on the top in place of the ordinary burner. Experi- ments have shown that such a lamp will burn 12 hours with undiminished brilliancy, but that at the end of that time the silver will have been converted into pure silver and would re- quire to be revivified. This is easily effected by washing it in a solution of nitric and hydro- chloric acid. It is then replaced in the battery for further use, there being no waste of the sil- ver. The marked advantages of this system of domestic electric lighting, beyong the portabil- ity of the lamps, are the absence of fumes, the small battery capacity, and the great electro- motive force.

DRY ROT.—A Russian professor has been ex- perimenting on the best way to remove dry rot. He says that a thorough draught will destroy the parasite within twenty-four hours. If the action of draught be assisted by that of sun- light, a few hours will often suffice to put a stop to further damage. A concentrated solu- tion of common salt is very efficacious, and the stronger it is used the more rapid its action. The action of a concentrated solution of cupric sulphate (blue stone, blue vitriol) is still more energetic and complete than that of common salt. Crude carbolic acid is rapid in its action and cheap, but inconvenient to use. But he considers that the best, cheapest, and most con- venient material to employ is the tar obtained when birch wood is distilled for acetic acid; the under surfaces of the flooring are painted with the tar.

A NEW YORK ELECTRICIAN, Prof. N. S. Keith, has invented an electrical storage bat- tery, similar in working power, but simpler in form, to that of Faure, and a company of San Francisco capitalists has just been formed for putting it into practical use. It is proposed to employ it for electric lighting, and also to run motors and street railroads. Prof. Keith claims for his invention that fully 70 per cent of the power generated can be used in moving passen- gers in an ordinary street car, while with the cable systems only 32 per cent is available. Very little change is necessary to apply electric- ity to cars previously drawn by horses. It is said that one of the San Francisco systems of street cars is about to be run by the new elec- tric Keith motors and storage batteries.

ANOTHER USE FOR ELECTRICITY.—Still another wonderful use has been found for electricity. Recently, electrodes connected with a dynamo of the power of forty ordinary Daniell cells were put into forty-five gallons of fresh milk, and in exactly four and one-half minutes the fluid was, as dairymen say, churned, the butter rising on the surface. The quantity obtained was fully equal to that procured in the ordinary way, and the quality perfect.

A SINGULAR GROUP OF SPRINGS.—A remark- able collection of mineral springs exist in North Georgia. They are known as the Catoosa Springs, and consist of fifty-two springs, all different in character, within the space of a two-acre plat.

MINING AND SCIENTIFIC PRESS.

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Passing Events.

The receut gold strike in Oregon, mentioned on another page in our "Mining Summary" seems to he creating quite a local excitement. It will douhtless lead to much more vigorous prospecting in that region. Southern and Southeastern Oregon have not heen very thoroughly prospected, and there are douhtless many good leads there.

The good fortune of the Mayflower Gravel Company, in Placer county, is an interesting current topic. The gravel encountered reminds minere of the early daye of mining in this State. How much of this very rich gravel there ie remaiue to he seen; hut the days of rich, auriferous material are hy no means over yet in California.

The disorganization of the engineer corps of hoth the Southern and Central Pacific Railroad companies is an apparent evidence that for a time, at least, further railroad building on this coast will be discontinued.

The prices of lead and copper still continue very low, much to the detriment of many mining companies on this coast. It is the general opinion, however, that they will go no lower. Still, if they do, some of the mines now working will he compelled to close down.

Iron Moulders' Union No. 164 has sent the following notice to thc local foundries: This is to inform you that on and after Monday, June 8, 1885, Iron Moulder's Union, No. 164 of San Francisco, will uot allow any of its memhers to work in your establishment at a rate of pay less than $3.25 a day, whether by day work or piece work. Apprentices upon serving their term of apprenticeship shall be allowed a period of six montbs before coming under tbis schedule.

Power Used in California Manufactures.

Durlug the ten years betwesn the ninth and tenth census it was found that the total amount of power used in manufactures, both steam and water, in the United States, increased 1,064,695 horse-power. Of this increase, 94,948 horse-power, or 8.92 per cent, is due to the increase of water-power used, while 969,747 horse-power, or 91.08 per cent, is due to the increase in the amount of steam-power used. From 1870 to 1880, the average amount of power used per hand has increased from 1.14 horse-power to 1.25 horse-power. The average power of water-wheels has fallen off from 22.16 horse-power to 22.12, which is largely due to the various forms of small water-wheels, or motors for light work. The average power of steam engines has increased from 30.29 horse-power to 38.69. The total amount of horse-power in uss in manufaotures in this country is 3,410,837; 35.93 per ceut is water and 64.07 per cent steam power.

Government statietics show that the total steam and water-power used in manufactures in California equal 32.921, a percentage of inorease in ten years of 29.76 per cent. We used in 1870, of our total horse-power, 35.60 water and 64.40 per cent eteam. In 1880 we used 31.87 per cent water and 68.13 steam, showing that we are coming more and more to steam.

California ranks among the States as No. 25 in the total power used in manufactures. The percentage of the total steam and water-power of California is 0.17. The rank in water-power is 36; percentage of the total water-power, 0.15; rank in steam-power, 36; percentage of the total steam-power, 0.18. California has 155,980 square miles. The total eteam and water-power per square mile is 0.21 horse-power; water-power per square mile, 0.03; steam-power per square mile, 0.18.

In manufacturing in this State there are 1,000 establishments using power. They use 205 water-wheels, of 4,850 horse-power; 990 boilers, 179 engines, with a power of 28,071 horses, making total steam and water-power in horse-powers, 32.921. The following tahle, from the census reports, will show the distribution in this State:

SELECTED INDUSTRIES.	No. of establishments.	WATER-POWER. Number of wheels.	WATER-POWER. Horse-power.	STEAM-POWER. Number of boilers.	STEAM-POWER. Number of engines.	STEAM-POWER. Horse-power.	Total steam and water power. (H. P.)
Agricultural implements	7			8	8	106	106
Boots and shoes (factory)	9			5	5	58	58
Carriages and wagons	4			3	3	55	55
Clothing, men's	2			1	2	65	65
Flouring and grist-mill products	149	69	1,672	145	97	5,769	7,441
Foundry and machine-shop products	85	6	110	70	77	1,691	1,801
Iron and steel	1			49	16	1,650	1,650
Lumber, sawed	251	90	2,225	285	211	8,783	10,992
Paper	6	6	225	17	20	610	835
Printing and publishing	53			30	30	374	374
Salt, doors and blinds	30	4	17	3	3	32	49
Sash, doors and blinds	6	3	52	28	21	1,078	1,128
Silk and silk goods	2			3	2	32	53
Sugar and molasses, refined	2			24	9	450	450
Woolen goods	9	3	115	17	9	610	725
All other industries	384	27	486	322	257	7,746	8,232
Total	1,000	205	4,850	990	770	28,071	32,921
Less duplicates		2	65	7	5	151	216
Gross total		207	4,915	997	784	28,222	33,137

THE Cove Creek Sulphur Works, Utah, ship about three carloads of sulphur every week. It goes to Idaho, Oregon, Washington Territory, Wyoming, Colorado, New Mexico and Texas, and the demand is gradually hut steadily increasing as the merits of the Cove Creek product become known.

AMOS BOWMAN, formerly connected with the California State Geological Survey, has heen for some years past engaged in geological work in British Columbia. He is now at work surveying sections of the British Columhia coal fields.

Petroleum.

It may not he generally known, hut it is a fact, that California stands tbird in the list of petroleum producing States of the Union. Pennsylvania leads, and New York is second. After this State comes West Virginia, Ohio and Kentucky. Some little is found in Colorado, Wyoming and New Mexico, though not much has heen done in the latter places. California is gradually increasing her production, as new wells are opened in Southern California, and the industry is now a prosperous one here. As far hack as 1878 we produced here 15,227 harrels. In 1879 we increased to 19,858 harrels; 1880 showed returns of 42,399 harrels; 50,000 harrels in 1881, and 70,000 harrels in 1882. The year 1883 showed an increase, and this year the estimated production is over 100,000 harrels. A harrel is uniformly 42 gallons. Ws consums all the oil produced and ahout 100,000 gallons from the East as well.

The period of productiveness of an oil well is very uncertain, and almost all the owner can he positive of is that tbe well is producing; he cannot ascertain the prohable duration of its productiveness. As a general thing a large flowing well is but short lived, while a pumping well of moderate size is more likely to have a long life. The character of otber wells in a district and the length of time they have been producing, also furnish some assietance in solving the problem, but even with thie help a definite eolution is impossible. Varioue causes, and many no doubt of which nothing is known at present, conspire to check the production of oil wells, and the well, whether pumping or flowing, may euddenly cease producing and no reason he perceptihle. In a majority of cases, however, the wells fall off gradually until they cease to produce.

The average cost of producing a harrel of petroleum is very difficult to determine. This determination in the case of a single well depends, among other things, on the depth to which the well is drilled, and the difficulty attending the process; upon the cost of pumping, if not a flowing well; and upon the amount of oil produced. Accordingly it would he impoeeible to decide exactly the cost of a harrel of oil from an individual well, uutil it had ceased producing; while to ascertain the average cost of production, with reference to all the wells, would he a well-nigh impossihle task. Of course rough estimates have heen made, hut these have been generally in regard to pumping wells of small size, and of only local value; and a statement covering all kinds of wells and all the oil produced cannot be made.

A Novel Exhibition.

International expositions, trades exhihitions, fairs, etc., are so common in these days that they have come to he considered hy many as merely great advertising affairs. In fact, this seems to he the hest purpose they serve, although instructive in every way to the visitore. Rival manufacturers ehow their products to best advantage, and sections of country desiring immigrants, hring forward in a practical way all the advantages, by ehowing the mineral, agricultural and manufacturing material and products. New features have to be added to all tbe more prominent exhihitions, in ordcr to attract attention and visitors, and those held in the United States have been celehrated hy the variety of novelties presented.

It has remained for a foreign country, however, to make one exhihit which for novelty exceeds most of those of which we have heard. At the Antwerp exhibition they have beeu exhihiting a colliery. It is not a miniature or a mere wooden or plaster model, hut the complete model of the underground workings of a coal mine. There is the hoisting shaft, down which the visitor may travel into the darknese of the workings some 30 feet below ground. Here he will find everything ae it exists in an actual mine, less the firedamp. There are roads, faces of work and drifte in progress; even the water and the dirt have not heen forgotten, as the visitor will learn on returning to the daylight. Real miners have been provided to show how the work is performed, and horses not less real are there to haul the trains of tuhs to and fro. Such an exhihit was sure to attract hy its novelty, hut the result is even greater than the expectation of the promoters. The pithank is crowded from opening till closing time, hy persons patiently waiting their turn to descend.

Mine Pointers.

If half the energy and persistence put into efforts to sall mines wers put into efforts to work them the miners and the country would be hetter off. Where ore is producsd and shipped the huyers will hunt up the mins, whereas when it is unproductive the mine has to hunt up the huyers.

Nothing looks more damaging to a camp than to see a lot of half-opened mines lying idle. People who might invest get the impression on seeing idle claims that they cannot be worth much, or some of them, at least, would be worked. If claims are heing prospected right and left the natural inference is that the owners themselves think there is something in them, while when no work is heing done an appsarance of practical ahandonmsnt is given.

Prospectors should he encouraged in evsry way, and not looked upon as visionary msn who dislike regular work. Many good miners maks poor prospectors. Prospecting is a kind of work for which some men are particularly adapted, and hecause they lead a nomadic life it is no reason that they are not as good citizens as those living in a town for yeare. They are the pioneers of the mining oamps, and serve a most useful purpose, since the reeult of tbei searches is the hasie of the mining system.

Upon the active working of its mines is base the prosperity of any mining camp. The formation of companiee, the eelling of etock, the transfer of properties, the selling of town lots and the ereotion of buildings, all amount t nothing unless the mines are worked. A fictitioue prosperity may occur for otber reasons i a mining camp, but it can only last a few months unless active work is pushed in tb mines themeelves.

When tbe expenses of a mine have to be ou down in order to make a profit, the last ones t he discharged should be the underground miners. The "office" ought to be commenced on first In fact, there are a good many mines run on th "top-heavy" system, where a reduction of offic force would he a heneficial thing at any time

A Reason for Mining Activity.

The activity now going on in Shasta count mines appears to elicit more mention fro hoth local and metropolitan journals than really descrves. While there is nothing bu truth in the etatement that her mines are legic and rich, yet an investigation of her miner resources, when compared with other distric that lack tbe advertising facilities enjoyed b Shasta, ehowe that French Gulch and oth mining camps of tbat county now producin hullion and enjoying notoriety are merely d ing now what they could have done years ag f the proper attentiou had been paid to legit mate mining. There is one thing that Shasta present prosperity demonstrates, and tbat is th it pays to advertise. If it were not for the pres Shasta's wealth would, in all probability, l as dormant to-day as it was two years ag There are other mining districts in Californ that are as good, and possibly hetter, th Shasta, and they only lack capital and atte tion to demonstrate the fact that mining quartz in California is yet in its infancy. law punishing misrepresentations, a muzzle high-priced mine-owners, the hanishment high-salaried dude euperintendents, and t working of minee on "etrictly husiness" prin ples, is all that is needed to insure Shast continued proeperity, and create a legion other districts of like merit and hottom. Ma old diggings throughout the State, if work as these old minee of Shasta have heen and s now heing worked, would enjoy equal notorie and similar, if not greater, prosperity.

THE Nellie Grant lode, on the east eide of R Mountain, Montana, is to he worked hy a organized company. A meeting was held Helena and the following officers were elect President, Mosee Morris; vice-president, E. Dunphy; treasurer, Samuel T. Hauser; sec tary, W. E. Cullen. The capital stock is fi at $600,000, It was decided to immediat ehip machinery, such as hoieting wor pumps, etc., and as soon as they can he work will he hegun.

WORK has heen resnmed on the Blue Jac mine, at Bull Run, Nev. This mine was cated 15 years ago, and work was suspend upon it five years ago.

Local Notes.

The whole force of civil engineers of both the Central and Southern Pacific Railroad companies was dropped last week. The engineers received a hint to resign and they all did so, including Col. Geo. E. Gray, chief engineer of the Southern and C. P. Hood of the Central Pacific. It is understood that the engineer corps will be reorganized on a different basis entirely. What this basis is to be is so far known only to the managers. It is not likely, however, that the whole force will be again employed, as very little new railroad building is going on.

The eucalyptus boiler scale preventive made across the bay, and a California invention, is being introduced with success abroad. Mr. McGillivray, who is now in Liverpool, has been showing the steamship owners there what can be done in the way of preventing the formation of scale in boilers, and is meeting with success in introducing the compound. It is already quite extensively used on this coast.

The Association of Stationery Engineers of this city intend presenting a petition to the Board of Supervisors for an ordinance creating the office of boiler inspector. The association and others have for some time been endeavoring to get such an officer appointed, and the last Legislature was asked to pass a bill making a State office of the kind, but it did not do so. The recent lamentable occurrence at the Potrero, which is said to have resulted not only in an unfortunate young man's death, but also in making a maniac of his mother, has had the effect of causing the engineers to make a determined effort to have a boiler inspector whose duty it shall be to inspect once a year every boiler in the city, and also see that the proper material is put into boilers manufactured here. This man is expected to be a thorough, practical steam engineer, and he is to put all men in charge of the boilers through a course of examination to ascertain their efficiency. The inspector will be authorized to issue certificates to all competent engineers so employed and no one not holding such certificate will be allowed to have charge of or attend to a boiler.

Savage & Son, of the Empire Foundry, have concluded to pay all their employes the wages allowed by other iron firms, and that agreed upon by the contract made with the iron workers at the conclusion of the late strike. All the men in the Empire are now at work at the same wages allowed by the Union Works.

The Representative Council of the Iron Trades' Unions, which now has 1,500 members, met this week. There are six unions in the federation, and it has three representatives from each union. The executive committee reported, recommending a federation of all other unions of various industries, and to form a similar amalgamation. The report also recommended to carpenters and joiners the establishment of a permanent committee to look after the safe construction of buildings. The report further recommended the unions to report on the hiring and general apprentice system as practiced at the present time, with a view of having a law passed which will provide the means of turning out a better class of mechanics. Resolutions were also adopted to aid the Association of Stationary Engineers in their efforts toward having an ordinance providing for a boiler inspector.

Mr. C. M. Plum, one of the trustees of the James Lick estate, has returned from the East and brings gratifying intelligence concerning the object lens of the great telescope for the Lick Observatory on Mount Hamilton. It is already pretty generally understood here that the delay in the completion of the glass has been on account of the difficulty in obtaining a perfect crown glass for the achromatic object lens. The flint glass has been in Clark's establishment at Boston for two years or more. The crown glass, which, like the flint, was cast by Feil in Paris, has been delayed by circumstance which have occurred there. While Mr. Plum was East, Mr. Clark telegraphed to Feil, of Paris, inquiring with regard to the progress of the 36-inch crown glass lens, and he received the reply that a successful cast had at last been made, and that it was then being polished, that they might the better see that it was perfect. It was expected that it would soon be ready to ship to the Clarks at Boston, who will give it its configuration, and they as well as the trustees feel quite sanguine that there will be no further delays. The object glass will be 36 inches in diameter, and will cost $50,000,

Shasta County Districts.

[From Our Traveling Representative.]

The activity now going on in the French Gulch district places it in the lead of all other districts of the county at present. The mines now producing bullion are not new discoveries, as they have been known more or less for years past. Shasta's present boom is more of a renewal of work on business principles and the intelligent development of mines, rather than the discovery of new and rich bonanzas. Too much boom has been given to Shasta's unlimited advantages. Misrepresentations have been made and are being made every day. Some districts possess phenomenal adventages, while others are as wanting as New Mexico, or Arizona's most uninviting localities.

French Gulch.

The town of French Gulch is 15 miles north of Shasta, the county seat. During the early days of the camp's existence the place was like the average California mining town—"a dandy camp." The gulch in which the place is situated has produced millions, and until quite lately but little prospecting was done for quartz mines. As the richness of the gulch dwindled down to wages and grub, the miner either sought higher up on the hillside or left for new diggings. A number of gold quartz mines have been worked at a profit for some time past. Unfortunately, these mines were owned and handled by men of limited and in some cases very meager capital. The recent decline of stock gambling, the suppression of hydraulic mining and a boom in the legitimate has caused the healthy condition of French Gulch's present prosperity.

The Mines.

On the southeast slope of the ridge, along which runs the line between Shasta and Trinity counties, lie the mines and prospects now attracting so much attention toward French Gulch. The entire mineral belt, as well as mines of non-mineral bearing formation have been taken up and the capitalist who has enough money to buy one or more of these locations has sufficient to live without buying any mines. The Coleman group of mines is the most extensively developed at present and produces considerable bullion. W. T. Coleman, of San Francisco, is largely interested in this as well as adjoining districts. The Niagare is the principal mine of the group and has recently opened up in a highly satisfactory manner. Ore in quantity is exposed in a number of places, and as development progresses, encouraging results follow. A depth of 260 feet on the vein has been reached and the ledge shows from three to five feet in thickness. Ore stoping is going on in three levels of the mine. The vein matter is auriferous quartz carrying some sulphurets. Three classes of ores are produced running respectively, $80, $50 and $30 per ton. A 10-stamp mill with a capacity of 16 tons per day is operating on the Niagara ores. Four Frue Vanners are used in concentrating. The concentrates run from $200 to $450 per ton, and the tailings assay as high as $8.50 to $14. Steam power is used in running the mill and concentretore, as water is somewhat scarce as high up on the hill as these mines are located. The Coleman system of mines are working the Shafter and a number of other claims.

The Meyers mine adjoining the Niagara has some 350 feet of development in the way of tunnels, shafts and cross cuts. Two parallel veins in rather broken slate and porphyry formations is the result of development so far. The quartz is both firm and decomposed, and prospects high in gold with a small percentage of sulphurets. Owing to the irregular course of the veins and the broken conditions of the entire hillside the property is but a good gamble, one however, that bids fair to open up into a rich mine. The ore of both veins prospects well and runs so as to average about $30. A good body of manganese has been pierced by a cross-cut from one of the main tunnels. On the dumps of this property is 75 or 80 tons of rock now awaiting shipment to a custom mill near by for treatment. A 5 stamp mill with Duncan concentratore is talked of for this mine soon.

The Scorpion, next to the Meyers mine, is worked under a lease by Lawton and Higgins, with good results and a favorable outlook. The quartz vein runs nearly at a right angle with that of the Meyers property. The formations are slate and porphyry. The dip is almost perpendicular and the vein is in solid formation. Twenty-five tons recently milled averaged between $30 and $40 per ton. The present working of the mine is pushed on ore, and with a view of taking out every pound possible before the expiration of their lease.

The Highland group have resumed work and will push development extensively during the present season. A few Red Bluff people are interested in this group. The ore runs high in sulphurets and will be handled with a view of saving them. The owners of the Highland have no better prospects than when they abandoned their old workings, but are stimulated by the business-like methods and success of others near by them in the district.

The Subrants and Accident, adjoining the Niagara on the west, owned by Dr. Olendorf, James Gouch and others of Red Bluff, have a 200-foot tunnel in on one of their claims in search of the ledge,

John Souter, of the Washington mill, is doing custom work on district ores and is pushed to his utmost capacity to handle the trade. He has a 10-stamp mill, with two Frue concentrators. The mill is situated in the gulch just below the Niagara, a distence of three miles from French Gulch. This mill employs five men.

Messrs. Morrell and Wheeler, of French Gulch, are pushing development on a Summit gulch prospect.

The Queen of Diamonds is working a good force of men. This property is owned by Thomas Green, and has a cannon-ball mill and Dyer concentrator at work. The ore is high grade.

The Brunswick has shut down on account of water.

Work is being pushed on the Alexander, near the Green mine.

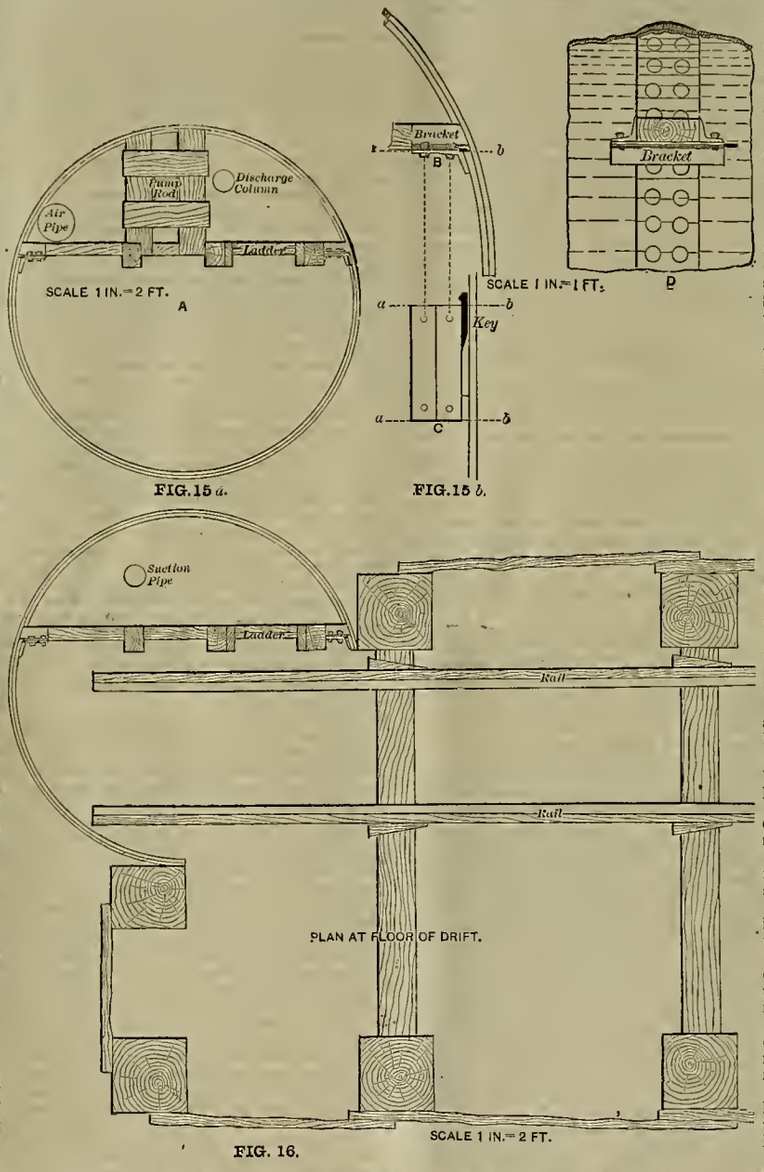
Phillips, northwest of the Niagara, is working seven men. His pay streak is a decomposed quartz and porphyry, with yellow, ocherish, soft rock, running from $5 to $25 per ton. Some 500 feet of development has been done on this property.

The Niagara people are laying pipe to carry the water from the Scorpion tunnel to their mill.

French Gulch Float.

One hotel.
No church.
Six saloons.
Scarce—enterprise.
Many pretty homes.
High—real estate and prospects.
Legions of lovely girls and some old maids.
Property is at high-water mark in this place.
The prosperity of the camp has improved wonderfully of late.
Toll-roads and exorbitant tolls are a drawback to Shasta county.
A telephone is talked of from Colemau's mine to French Gulch.
The proverbial mania for a mill before a mine is reging here now.
As yet, no depth worth while has been made by any mines in the district.
There are many prospectors hereabouts who are putting in their best licks to discover new bonanzas.
The majority of good paying mines are blind veins accidently discovered by running a prospect tunnel.
The camp is not infested by the usual supply of gamblers generally inflicted on prosperous mining camps.
Adjacent districts are profiting by the work now progressing so successfully in this district, and they are emulative accordingly.
The discovery of rich sulphuret ores is causing mine owners to investigate the merits of the various concentrators now offered for sale.
Men cannot go into the hills of this district on as a little money as many think who read the glowing accounts about frequent new and rich strikes.
The pay for miners is $50 a month and found, or from $2 to $3 per day. Wages are not uniform, owing to many small mines employing newcomers at reduced rates.
The stages from Redding to French Gulch leave both places and arrive after dark, the trip being made at night. The distance from Redding to French Gulch is 22 miles.
Experts and middlemen representing capital are numerous, and between their boastings and the imagination of the average mine owner, it is impossible to buy a prospect for anything like its actual value.
Strange at it may seem, miners with a few tons of ore on their dumps let it lay, and in some instances run in debt for grub and supplies instead of shipping it to a custom mill and making the mine pay its way.
Miners are flocking into the district in numbers that cause many to go out on foot. The place is already overstocked with prospectors of limited means. Capital is what is needed, yet harred out by high prices and misrepresentations.
French Gulch and Deadwood resemble the famous camps of Virginia City and Gold Hill as to location. The ridge along which the dividing line between Shasta and Trinity counties run also divides the mines of Deadwood and French Gulch.

F. W. S.



PLAN OF OPENING AND TIMBERS AT BEGINNING OF DRIFT.

Jerome district, 60 miles north of Prescott, Arizona, is said to have fine ledges of copper, silver and gold. The region is now being prospected.

The Bald Mountain placers, Nevada, have been shut down for the season, as the water gave out.

Auriferous Gravel in Arizona.

[Written for the PRESS.]

Perhaps the most extensive unworked beds of auriferous gravel on the Pacific Coast, between British Columbia and Mexico, are in Yavapai county, Arizona. This great county occupies the center of the northern half of Arizona and covers an area of 30,000 square miles, all included within the elevated plateau in which the greater portion of the Territory lies. This high table-land is traversed by a number of short broken mountain ranges, trending usually northwest and southeast. All of these in the southern half of the county are rich in minerals, principally gold, silver and copper. The general slope of the mountains from base of foothills to summits is very gradual, although in places the higher ridges of some of the ranges rise quite abruptly from the base hills, and the formation has been favorable for the deposition of vast gravel beds, as in the middle Sierra counties of California.

Placer Mining

Has been carried on in Yavapai for more than 20 years, but a comparatively small amount of ground has been worked, owing to the scarcity of water, although this county is more highly favored in that respect than others in the Territory. During the rainy season the mines most convenient to the water supply were worked so long as the latter lasted, and in many cases yielded enormously. It is not known that the average richness of the unworked placers is fabulously great, and probably they are not more so than were those of the El Dorado of the Golden State, but there are certainly large areas that would prove veritable honanzas were it possible to place them under a sufficient supply of water.

The Same Old Experience

Of other surface diggings has been repeated here. As soon as it became impossible to work the mines so as to make them yield to the very best advantage—due to expense of conducting water to them, or to a scarcity of the same—they were forsaken. Many of these same mines to-day will pay, and some are paying, good wages to those engaged in working them. The time has come here for the miner to be satisfied with reasonable wages. There has been very little enterprise shown in developing the placer mining industry, an important part of the natural wealth of this section. By constructing dams in suitable places and conserving the water in natural basins in the mountains where there is an over-abundance, the period of working the placers might be extended every year to at least two or three times the length of the rainy season—which in Arizona occurs during the summer—and in the more favored localities, during the twelve months. No large works of this kind, common in other parts of the west, have been attempted here. An outlay of many thousands of dollars would naturally be involved, but several localities might be named where such would prove a paying investment.

A few words relative to what has been done

In Earlier Days

Will be of interest, and a brief resume of such, mainly condensed from the accounts of a few of the principal districts as recorded in the "Resources of Arizona," published under the authority of the Territorial Legislature, will be given. One of the oldest districts is that of Lynx creek, six miles east of Prescott. The creek giving the name to the district has been one of the richest gold-producing streams in the Territory, and it is estimated that over $1,000,000 has been taken from the gravel beds through which it passes. They are still worked when water is obtainable in sufficient quantity. Of this district more will be said later. The oldest district in Yavapai, in the southwestern part of the county, "is famous as the scene of the discovery on Rich Hill. In a depression on the summit of the mountain, about 6,000 feet above tide water, the coarse gold was found lying on the bare bed-rock. Pieces of the pure metal, worth several hundred dollars were picked up, and over $500,000 was taken from about an acre of ground. Butcher knives were used to dig the gold out of the seams in the rock, and it was not an uncommon thing to find from $1,000 to $5,000 under a small boulder. How the gold was deposited in such a place is a mystery which has not yet been solved. The gulches and ravines running down from the mountain contained considerable treasure, and are worked by Mexicans up to the present time. It is estimated that Weaver has produced over $1,000,000 in placer gold." The Mexicans who still remain there

Dry-Wash the Gravel,

By which process a large percentage of the gold is lost, and were it not that it is very coarse they could not make it pay. As it is, they do very well, and during the short time that water is to be had to enable them to use the rocker or pan, often obtain such results as were heard of when placer mining was in its glory in California. Others in that district pack the gravel to water on donkeys a distance of five or six miles, and "pan it out" and make wages. Unfortunately, there are no large streams near the richest part of the Weaver district, and mining is carried on in the face of every disadvantage, and necessarily on a limited scale. Hassayampa district has also turned out a large amount of treasure, but less than the two above mentioned. These are the most notable placer districts, but there are others of less importance on smaller streams. Yavapai county has turned out more gold than all other counties in the Territory; but in the yield of bullion of all kinds the small county of Cochise, in the southeastern corner of Arizona takes the lead.

The Only Hydraulic Mine

In Yavapai county is in the Lynx Creek district, the property of F. M. Murphy & Brother. The gravel carries a large amount of gold, and the lack of a sufficient supply of water is all that prevents it from being one of the most valuable mining properties in the Territory. On this account it is worked only a short time each year during the rainy season, but for that brief period it pays well, the average yield of gold being 40 cents per cubic yard. The water is supplied through a 14-inch pipe reduced to six inches at the end. By constructing a reservoir and storing the water, the greater part of which runs to waste, the mine could be worked several months each year and made to turn out a large sum annually. The cost of making such a reservoir would be considerable but the increased yield from the mine in consequence of the extended period during which it could be made to pay would soon reimburse the owners for all outlay. The bed of gravel which is expected to yield at the rate named, 40 cents per cubic yard, is a large one, and it is calculated that if worked as long as practicable each season with the aid of a reservoir for the storage of water, would last for more than a quarter of a century. The possibilities of the surface mining regions of Yavapai are great, but a large amount of money must first be expended for the conservation of water and conducting to the mines. GEO. W. STEWART.

Prescott, A. T., June 2. 1885.

The Duncan Concentrator.

The Amador *Ledger* says: In a recent issue we made mention of the fact that three Duncan concentrators had been put up on the Amador Queen mine, to run in connection with a Huntington mill with reference to determining the ability of these machines to handle the ores of this mine. These ores, it is well known, are very base and difficult to concentrate, and therefore afford a severe test of the capacity of any machine. * * * We are glad to be able to state that the Duncans have been a perfect success, and under circumstances that leave no doubt of their adaptation to all this class of ores that have hitherto resisted successful treatment. The concentrates are certainly as fine as we have ever seen, and are claimed to be as close work as was ever done in this way. The subject of ore concentration is one of vital interest in this county, as well as in most other gold mining districts, from the fact that our ores carry about as much value in their sulphurets as can be saved by the ordinary process of amalgamation. The importance of such an appliance can therefore be readily appreciated, as the value of many mines is determined largely by what can be saved from these base products. Mr. Shugert, the manager, informs us that he has ordered eight additional Duncans for his new 20-stamp mill, now nearly completed, which with the facility afforded by this improved method of treatment, ought to add largely to our monthly product.

The Inyo *Independent*, speaking of concentrators, says: We made mention a few weeks ago of the experiment of Mr. Shanfield, at the Maxim mill, in the matter of concentration, and of the success that had attended it. Further experiments prove beyond question the practicability of this process, and demonstrate the fact that all of our low grade galena ores can, by a very inexpensive method, be put into a condition to smelt profitably at the mines where produced or for shipment to other points. The concentrators in use at the Maxim mill—the Duncan, made by the Pacific Iron Works, of San Francisco—though new to this part of the country, we learn have been pretty generally introduced throughout the State, working on gold sulphurets as well as galena ores, giving great satisfaction to parties using them. The first thing that attracts attention is their simplicity and absence of wearing parts, that make such machines so difficult to keep in repair. Then the fact that these machines adjust themselves so readily to all the varying conditions of the pulp, water, etc., without any appreciable loss of mineral. * * * The proprietors of the Duncan are to be congratulated on having perfected perhaps the most valuable improvement ever applied to the reduction of ores, and we feel sure that the miners of this, as well as other sections of the country, will not be slow to appreciate it. There are millions of tons of low grade ore in this county alone that by this method of reduction can be made to pay a handsome profit, and we expect to see these operations multiplied largely here, as well as in other parts of the country.

A RUSSIAN traveler predicts that Thibet will prove to be a second California, as during a recent visit there, he found the natives gold-washing in the crudest way, but with the richest results.

Transit of Jupiter's Fourth Satellite.

In March of last year the President of the California Academy of Sciences, Prof. Geo. Davidson, called attention to the observations of the black transits of the third and fourth satellites of Jupiter, made by himself and Messrs. Burckhalter and Hill. Since the publication in the PRESS of Professor Davidson's observations of the dark transit across the body of the planet much interest has been manifested in the appearance of these satellites: and an appeal has been lately made to astronomers who have observations of these phenomena. A special call before the Royal Astronomical Society has been made for all past observations. At the meeting of the Academy this week, Prof. Davidson transcribed from the memoranda of Mr. Charles Burckhalter of Oakland, his observations of the transit of the fourth satellite on the 21st of May, made with his 10½ inch reflector, equatorially mounted.

"At 7:25 I commenced observing, and was almost startled at the faint appearance of the satellite which was then about 15 seconds of arc from the limb of Jupiter. The first eye piece applied was a Huyghenian magnifying 215 diameters, and using the full aperture of the reflector. A Ramsden of about 90 diameters gave nearly the same result, but the faintness was more decided; and with a power of 640 the satellite was scarcely visible.

"The atmosphere was much disturbed and therefore the definition was blurred. Sat. IV gave about one-fourth as much light as Sat. I, and was insignificant as compared with III. I especially noted that satellite IV had a brownish color; something I had never noticed before.

"At 8:05 and 8:25 I made the similar observations with similar results, using powers from 90 to 320 diameters. The only change was in the growing faintness of the satellite, which was then about one-half the magnitude of a faint star 4' from the north, following limb of Jupiter.

"Numerous observations to 9:10 showed the decreasing light of the satellite, when it became an ash or grey color, and the satellite—now shorn of its rays—appeared decidedly elongated in the direction of Jupiter's equator. The length was apparently twice the breadth, and while I have little faith in this proportion, on account of the disturbed condition of our atmosphere, I am positive about the elongation of the satellites disk. But the most notable phenomenon was the smallness of the satellite, appearing one-third the size of satellite I, when in the same position near the planet's limb.

"The unsteadiness of the atmosphere prevented an accurate noting of the time of contact of the edge of the satellite with the edge of the planet, and my time may easily be one or two minutes in error.

"The satellite entered on the planet's disk at the upper edge of the dark equatorial belt of the northern hemisphere. At about 9:25 the second or inner contact of the two limbs occurred, and I carefully and anxiously watched for the possible dark appearance of the satellite.

"In five minutes after the second contact, I caught glimpses of the satellite as a *white spot*, after which it was invisible, but at 9:35 it was picked up as a dusky spot, but not at all dark. Making allowance for the brightness of Jupiter, the satellite might be called *dark grey* in color, but it was quite easily followed, although the definition was much blurred from increasing unsteadiness of the atmosphere.

"Leaving the telescope at 9:40 the observer returned at 10 and found the satellite as a *black spot*, but apparently two thirds smaller than before the transit."

From recollection the observer thinks that it was not so black as the transit observed in February 1884, but as it was in the present case within the dark belt at the equator, this may have detracted from its apparent blackness.

This observation suggests the possibility that the satellite has an area of white surface (say at one of the poles) and a remaining larger area of dark surface.

When the satellite approached the planet this white area was the visible part; but when it was well in, on the body of the planet, this white spot was lost in the superior brightness of the planet, but the dark area became visible; and the intermediate phases are accounted for on this supposition. It is a very great pity the satellite was not watched throughout the whole transit to detect its phases to the end. It might even lead to the determination of the rotation period of the satellite. The observation which Prof. Davidson made on January 15, 1884, shows the image of the shadow *black*, and the preceding disk of the satellite three or four diameters to the right is half *white* and half *black* but divided at an angle of 35° or 40° with the equator.

THERE is a great scarcity of good miners in this part of the county, and some of our mine owners have difficulty in getting a sufficient number of men. One reason of this is that good miners can do better work on leases than for wages.—*Mohave Miner.*

SEVERAL of the new discoveries in Lava creek district, near Wood River, have all the way from 50 to 100 ounce ore.

Calico Mines.

The Calico mines continue to yield a steady output of bullion, says the *Print*, which continues to increase gradually. According to the reports which we receive each week from Wells, Fargo & Co's office, the amount of bullion shipped is $1,359,946 since January 1, 1884. This does not include the returns from ore shipped to San Francisco, Pueblo or Kingman, nor from the Daggett Sampling Works which probably disposes of $6,000 or $8,000 worth of ore from chloriders every week, nor does it include the ore from the Sue mine which is crushed at the Waterman mill, amounting to probably $600 or $800 per day, nor the custom ore from Calico crushed at the Waterman mill. Taking the entire yield of bullion from the Calico mines on an average the amount can safely be estimated at $1,000,000 per annum.

The mines that are now in systematic operation, and are considered to be the principal mines of the camp are the Silver King (commonly known as the King), Garfield, Occidental, Bismarck, Silver Odessa, Sue, and such mines as the Blackfoot, Sam Houston No. 1 and 2, Humhug, Lone Star. Josephine, Snow Bird, Cuba, Burning Moscow, Gobbler, Veto, which are worked on a small scale, but are made to pay as they are developed.

Taking the mines on an average they are looking well, and are making improvements, and with an exception or two are operated in a legitimate and business like manner, being free from stock speculation and trickery. Owing to the hasty and discouraging reports in the early history of the camp by San Francisco experts, capitalists have been exceedingly slow to take hold of properties here, and the merits of the mines have but recently been recognized as worthy of notice by men of influence, who are not always practical mining operators. The lack of proper milling facilities has been a great drawback to the mines that are worked by chloriders, but the prospects of an improvement in this respect are becoming brighter, and we can reasonably expect that several small mills will be erected in the course of eight or ten months, and probably a smelter may be erected by that time.

The mines at Waterman, Alvord, Providence, Mescal, Ivanpah, Butte Valley, Kramer, Silver Lake and Soda Lake are in a most flourishing condition in proportion to the extent of developments, so that we can reasonably look forward to a considerable increase in the mining operations on the great Mojave desert within the next year.

Prospectors and Mining Bosses.

The Carson *Free Lance* says: Business men who are depending on prospectors to develop the country for them are liable to be disappointed. The prospector, like other mortals, considers his own interests first. There are several illustrations of this fact in the vicinity of Carson. At the Mountain House, on the Bodie road, Willard and McDonald are working a gold ledge. They have a miniature two-stamp mill, run by a water-wheel, on one of the mountain streams near the mine. They mine and mill about a ton of rock a day, and realize a profit of from $20 to $50 on each ton of rock so worked. When they need money, one of them takes gold bullion to the Mint sufficient for all requirements of their business, pays all bills and returns to work, happy and contented. They owe no one a dollar, and a mining excitement in their neighborhood would only be an annoyance. They are under no obligations to the public to create a market or to take their gold out of the mine and scatter it through the channels of trade. It is much safer where it is, and when their mine is worked out there will be no big mill plant on their hands.

In Red Canyon District, McKnight has a ledge where he took out about $1,000 with a hand mortar in one day last fall and now has a much larger amount in sight. He is working for the interests of McKnight.

Charley Knox has been working alone for years on a ledge about a mile north of McKnight's. During this time he has gone to his work many a day hungry and cold when potatoes were rotting in the cellars in Carson valley only a few miles below him, but people were waiting for him to develop the country so that they could sell those potatoes. Last December he found a rich chimney of gold quartz in his ledge and with a hand mortar soon had all that he wanted. Last Thursday he cut the same chimney of rich rock on a lower level and will probably lay away a few thousand dollars in gold dust, but, very naturally, feels under no obligations to those who saw him working hungry and cold to find his gold.

People who are depending on these prospectors for a mining boom will be disappointed. Mining booms do not originate in this way, especially in a camp where there is as rich rock as there is in Red Canyon and Silver Glance. If it had only a speculative value and was run on the assessment plan, things would be different.

An important strike has been made in the Paradise mines near Spring City, Nev. The strike is considered of great importance in Spring City, as it proves that rich ores exist in the district a mile and a half from the Paradise Valley, Bullion and Wild Goose mines.

Practical Mining.

A Two-Stamp Mill—One Ton a Day.

For some years past J. K. McDonald and M. Willard, two practical and very sensible miners in Silver Glance district, 34 miles south of Genoa, on the Aurora road, and about seven miles south of Red Canyon, in the same range of hills, have been prospecting and working a small ledge of free milling gold ore, and now they have it established on what might be considered a practical working and paying basis. They have a small two-stamp mill which they constructed themselves, run by water-power, and manage to reduce a ton of ore per day, on the average. They employ one man to assist them, and the three do all the work. The ledge is 18 inches wide, on the average, running about north and south, with a dip to the east, after the regulation Comstock style, and they have opened their mine to the depth of 140 feet. They select the best of the rock, reserving the rest for future reference, but, as may be easily seen and understood, they work at a profit, having very little expense. In the sweet by and by they hope to accumulate wealth enough to increase their number of stamps and mining facilities, and perhaps have a daily bonanza income, like Mackay and Fair. They have very little silver to contend with, therefore use no pans, but merely save the gold on amalgamated plates, etc. Mr. McDonald was in the city yesterday disposing of some of their bullion, and left for home last evening. These men consider themselves as doing well. Anyhow they are coming out ahead, and no thanks to any capital except what they take out of their own mine in the shape of pure gold, without any discount. They deserve whatever good luck they have, and many miners throughout the State, having the same facilities might follow their example to good advantage, instead of trying to sell out, or howling for capital to assist them.

The Minnehaha Company, composed of ex-Sheriff Swift and others of Carson, adjoin them on the south. It is an incorporated company with a valuable claim. In Minnehaha Canyon, two miles south, Beck & Co., a Reno organization, are working with fine prospects. Silver Glance district and vicinity shows many promising ledges, and many prospects which are liable to prove of considerable importance in the future mining history and bullion production of Nevada.—*Virginia Enterprise.*

FREIGHT FOR NEW RIVER.—The first shipment of freight from San Francisco to New River district, by way of Redding and Weaverville, arrived here this week, consigned to Thomson & Cohen. This is taken as an experimental trip, and the charges are a matter of much concern to shippers in that new and promising district. From San Francisco to Weaverville the freight is two cents per pound, and from here to New River the charge will probably be two and one-half cents, making a total of four and one-half cents for this lot, which is a small one. Experienced packers tell us, however, that if freight is shipped in considerable quantities—sufficient to keep a pack-train constantly employed during the summer—it can and will be packed for two cents per pound, making the total charge from San Francisco to New River only four cents per pound, and effecting a saving in time of not less than four or five days. While a round trip can easily be made from North Fork to the New River mines in five days or less, we are reliably informed that it takes 14 days to make a round trip from Arcata or Eureka. James Mullane will take in the freight now here, and has arranged to lay down Chico and Red Bluff flour at the mines for $5.50 per hundred. Flour from Scott valley and Eureka is selling at the mines at from $7 to $8 per hundred at the present. New River merchants can save time and money by having their San Francisco purchases shipped in care of B. & J. Redding, Cal., and if they make purchases in Sacramento can secure a still further reduction. As most of the provisions, tools and supplies required in a mining camp are of the nature known as "heavy freight," the matter of a cent or even one-quarter of a cent in freight charges is matter worthy of attention. The route via Weaverville is by all odds the shortest, quickest and cheapest, and all New River freight and travel should come this way. —*Trinity Journal.*

MINING LEASERS.—It is no unusual thing to hear miners say they don't want a lease of mining ground, says the Eureka *Sentinel*, because there is no ore in sight, or the mine has no record of ore shipped. There are cases in Eureka District where mine-owners have offered to advance grub and supplies, and their ground has been held in contempt. One man made good offers to several persons continually during the course of a year or more. One miner ventured, by a scratch, as it were, and was lucky in finding ore. Since then there has been a host of applications. The ground is let in square patches to a number of miners, and now there is no need to offer subsistence or aid of any kind. No more men are needed to take chances in the mine, and it is paying dividends to its several owners.

PRODUCTION of the precious metals in Mexico since 1493 amounts to almost $3,000,000,000, or about $1,000,000,000 for each century.

USEFUL INFORMATION.

TOUGHENED GLASS.—Mr. Frederick Siemens, at the London Society of Arts, has severely criticised the invention of M. De la Bastie, called "toughened glass."

The author stated in his paper on what he terms "Tempered Glass" that the French process was not a real manufacturing process, but an addition to known methods of glass-making. Articles had to be annealed first, and thereafter to be heated to such a degree as to render them soft; they were then immersed in a bath of heated oil maintained at a temperature of from 350 deg. to 400 deg. C. without evaporation. Articles so prepared were liable to burst suddenly into small fragments, either spontaneously or by sudden shock.

The author's own process consists of cooling the glass, not in proportion to its surface, but to its volume or capacity for heat. A sheet of glass of uniform thickness, having been heated uniformly to a sufficient degree, must be cooled on the surface of its two parallel sides, leaving the edges uncooled. The manufacture of hard glass depends, therefore, on the principle of uniform heating and cooling. The author has now made hardened glass at the Dresden Glass Works for six years; the output has steadily increased more than 50 per cent annually, from £600 value in the first year, until last year it amounted to over £7,000.

THE GOLD-BEATER'S ART.—If a sheet of gold leaf is held up against the light it appears to be of a vivid dark green color; this means that the light is transmitted through the leaf. When it is considered that this leaf is a piece of solid metal, a better idea of the extreme tenuity of thickness of the leaf can be comprehended than by any comparison by figures; nothing made by the hand of man equals it in thinness. This extreme thinness is produced by patient hammering, the hammers weighing from 7 to 20 pounds, the lighter hammers being first used. When the true method of this beating is understood, the wonder expressed sometimes that gold-beating should not be relegated to machinery ceases; the art belongs to the highest department of human skill and judgment. Apprentices have served a term, and have been compelled to abandon the business, because they never could acquire the requisite skill and judgment combined necessary to become successful workmen. As to the thickness of gold leaf, it may be interesting to know that 300,000 leaves, placed upon another, make a pile one inch thick. When laid up to the light, the leaf is so transparent that objects may be seen through it, that made for dentists throwing a blue shade when looked through. A fair year's work for a representative house is about 50,000 bundles of 500 leaves each. The workmen are mostly Americans, with some English and fewer Germans and Frenchmen.

TO CLEANSE A SOILED CHAMOIS LEATHER.—Many workshops contain a dirty wash leather, which is thrown aside and wasted for the want of knowing how to clean it. Make a solution of weak soda and warm water, rub plenty of soft soap into the leather, and allow it to remain in soak for two hours; then rub it well until it is quite clean. Afterward rinse it well in a weak solution composed of warm water, soda and yellow soap. It must not be rinsed in water only, for then it would be so hard, when dry, as to be unfit for use. It is the small quantity of soap left in the leather that allows the finer particles of the leather to separate and become soft like silk. After rinsing, wring it well in a rough towel and dry quickly, then pull it about and brush it well, and it will become softer and better than most new leathers. In using a rough leather to touch up highly-polished surfaces, it is frequently observed to scratch the work; this is caused by particles of dust, and even hard rouge, that are left in the leather, and if removed by a clean rouge brush it will then give the brightest and best finish.

A VALUABLE DEVICE FOR WARM WEATHER.—There is now being made, in London, by order of Government, an ingenious device, which will effectually protect the soldiers in the Soudan from the rays of the burning sun, and render an attack of sunstroke almost impossible. It is formed of light bamboo and paper, and may thus be described: On each shoulder is fixed a piece of bamboo, bent in the form of an arch; in the center of each arch a piece of bamboo, somewhat resembling an umbrella stick, eighteen inches in height, is securely fixed, and these sticks support a light awning two feet in length by eighteen inches in breadth; the frame of the awning is composed of bamboo, and the covering of paper painted green inside. The weight will scarcely be felt, and the wearer will thus enjoy all the comforts of a large umbrella, without experiencing the inconvenience of holding it up, and his hands will be left entirely free to carry his rifle or other articles. A device of that kind might be found useful for outdoor workers in the hot valleys of California. Who will introduce it?

A VALUABLE ENAMEL.—An enamel for artistic purposes, says a Dresden journal, may be prepared from a mixture of thirty parts, by weight, of saltpeter, ninety parts of silicic acid and 250 parts of litharge. Drawings can be made upon this enamel as upon paper, and the characters can be burnt in by means of a muffle in less than a minute. It can also be employed in the preparation of photographs without the use of collodion. For this purpose a mixture of ten parts of gum, one of honey and three of bichromate of potash, well filtered, is dried upon the enamel and exposed in the camera, the image being then developed by dusting over it a powder of ten parts, by weight, oxide of cobalt, ninety of finely pulverized iron scales, 100 of red lead and thirty of sand; the chromate is decomposed by immersion in a slightly acidulated bath. When washed and dried the enamel is melted by placing it upon a piece of clean sheet-iron, and coated with chalk, and the photograph glazed upon the enamel is then brought to view.

SHIP BUILDING IN NORWAY.—There are something like 800 men engaged in building iron steamers in one establishment in Norway. On comparing the wages paid at the yard in question, Mr. Raylton Dixon, a well-known shipbuilder of the Tees, estimates that upon a vessel of a given size the labor will cost 25 per cent less than that expended on a similar vessel built in England. Deduct from this advantage the freight on the materials used in its construction, which at the present time, with the exception of tinner, are imported from England, and the result is the Norwegian builder can turn out a 1,500-ton vessel more than $2,500 cheaper than his English competitor. The same authority further admits that as soon as the German plate mills are placed upon the same footing as those in England, which are laid out for rolling large quantities of ship plates, England will behold this trade slip away from her unless the workers will submit to still further reductions of wages.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.—It is understood that the next meeting of the American Association will be held at Ann Arbor, Mich., on August 26th, and following days. It was the original intention to hold the meeting of 1886 at Bar Harbor, Me., but upon a full investigation it was found that the facilities which that locality could afford would be quite inadequate to the requirements of the association. The selection of Ann Arbor was made by the permanent secretary, to whose discretion the choice of place was left. The mayor of the city and the president of the University of Michigan have both extended cordial invitations to the association, promising their hearty co-operation and giving assurances that ample accommodation for the members will be provided.

FLEXIBLE LIMESTONE.—A limestone has been found in South Carolina so flexible that a layer of it can be bent in a circle when damp, and will retain its form when allowed to dry.

GOOD HEALTH.

Does Death Sting?

The function of dying is actually vegetative—we fall to pieces like a flower. This very fact, that the process is chemical, confirms us in the conclusion that the final "throe" is as painless as the inconvenience is nothing to the fœtal pilgrim when he touches on daylight. A moment's examination of the way we are to die will show marks of goodness in our "taking off." The degree of sensibility is proportioned to the integrity of the tissues. An inflammation heightens it; age depreciates it. Any defect in nutrition disturbs the comfort of the individual until the carbonic acid generated in the devitalization of the blood becomes fixed in the cells or is no longer displaced. The sensory ganglia everywhere part with their irritability by virtue of this poison, and cease to conduct currents. The criteria of death are being satisfied, and the process is consummated when this extinction of sensibility prevails at the ultimate filaments.

During the progress of this dissolution of the nerve force, this creeping on of the numbness of death, the individual is rapidly passing into a condition of repose, and instead of torture or pangs, a degree of self-satisfaction oft approaching to enthusiasm is realized. The sensations peculiar to the therapeutical operation of opium, hasheesh, ether, etc., are not improbably akin to the mental activities of the dying. Barring the hallucinations experienced in the stupor as it gained on the subject, the moribund is familiar with naught that borders on suffering. This carbonic acid has poisoned or narcotised the several ganglia, and reflex productions are interdicted. In short, the notion of pain is forbidden the instant that any stimulus fails to excite a response. The condition to this irritability is that the nerve center and the track be sound. If this vigor vanishes, reflex phenomena are at an end, and suffering, physiologically speaking, is impossible, because of the arrest of the function of the sympathetic.

Fortunately, for a wholesome study of one's demise, there are assurances abundant from vivisection, the testimony of those who have been restored to consciousness, and the affirmations of the dying that there is no physical recoil from death. Bruney tried hard to resist the efforts made to resuscitate him from drowning, so bewitched was he by his prolonged slumber. Dr. Solander, the traveler, was so delighted with the sensations of excessive cold that he was the first to lie down in the snow to realize the luxury of such a death. William Hunter was sorry he was not able to "write how easy and delightful it is to die." Infants die as serenely as they breathe, and not a few among the advanced in years treat death as a friend to their infirmities. Hanging is naturally rated, next to crucifixion, a most distressing procedure. But it is reported of those who have been saved from strangulation that the agony promised to be brief, and was rapidly replaced by hallucinations of a fascinating variety. One would fain believe that the kind God who suffered us to feel no sign in coming would take no delight in turning our farewell into writhing—nay, he does not quit us at the last. He is our greatest benefactor in allowing us to sleep out of weariness. Death is, assuredly, no tax collector; its "jaws" are not the clutches of an assailant; there is no "victory to the grave;" the ghost speeds away from us as it entered with no ruffle. The sense of death, as Shakespeare has it, is most in apprehension. It is the fear of the lonely night, not the throes of nature, that makes the leaving painful.—*Medical and Surgical Reporter.*

CAUSE OF PNEUMONIA.—Pneumonia, with rare exceptions, extends from the lungs to the lining membrane of the chest (pleura), and hence is really pleuro-pneumonia. Its seat is not the mucus membrane of the bronchial tubes, as is that of bronchitis; nor the general substance of the lungs, as is that of lung fever; but the air cells and the neighboring minute tubes (bronchioles), which are wholly destitute of mucus membrane. Sometimes it is almost an epidemic. It often attacks more than one member of ths family.

Pleuro-pneumonia among horses is a very contagious disease, and has sometimes gone through the land, bringing ordinary business to a standstill.

What is the cause of pneumonia? One medical writer says that "neither colds, bronchitis, pleurisy, asthma, or any other lung affection induces it; that, in a large proportion of cases, it is not referable to any obvious causative agency; that, when it appears to follow exposure to a cold, it is probable that this acts only as an exciting cause, co-operating with the action of a special cause."

What is this special cause? This question has received no answer until recently. German investigators of the highest character believe they have at length found it in a microscopic parasite, thus placing pneumonia among the germ diseases. The parasites are oval, generally go in pairs; and, unlike all others, enclose themselves—several together—in a capsule.

On cultivating them out of the body, insulating them in fluid, and injecting a little of the fluid into thirty-two mice, all of the mice died, in from eighteen to forty hours, of pneumonia, while the blood showed the peculiar parasites with their characteristic capsules. Experiments by means of inhalation exhibited the same results. Different investigators seem to have confirmed the discovery.

Later experiments show that the lungs of animals which have died of pleuro-pneumonia contain the same parasites in large numbers, and that the disease is essentially the same with pneumonia in man.

WHAT IS OLD AGE?—The *Medical and Surgical Reporter* of April 11th contains a curious article on the "Suspension of Old Age," the leading idea of which is that "the real change which produces old age is nothing more or less than a slow but steady accumulation of calcareous matter throughout the system, and it is owing to these deposits that the structure of every organ is altered; elasticity thus giving way to senile rigidity. Blockage of various organs thus commenced, and sooner or later a vital part becomes involved, and death of necessity follows." To delay this process the writer advises the avoidance of food containing this calcareous matter, among which bread is prominent. Moderation in eating is enjoined, and among the articles recommended are "fruit, fish, poultry, flesh of young mutton and beef, because, as before stated, of their being less nitrogenous. All well and spring water contains considerable of the earthy salts, and should therefore be avoided, and cistern water used in its stead, because water is the most universal solvent known. Therefore, if taken into the system clear of foreign matter, it is to that extent the better prepared to dissolve and take up those earthly salts and convey them out of the system. The addition of 15 or 20 drops of dilute phosphoric acid to the glass of water, and drank three times a day, will add to the solubility of these earthy salts."

WHY CONTAGIOUS DISEASES ATTACK BUT ONCE.—Professor Tyndall thus endeavors to explain the immunity obtained against a second attack of a contagious disease: "One of the most extraordinary and unaccountable experiences in medicine was the immunity secured by a single attack of a communicable disease against future attacks of the same malady. Smallpox, typhoid, for scarlatina, for example, was found as a general rule to occur only once in a lifetime of the individual, the successful passage through the disorder apparently rendering the body invulnerable. Reasoning from analogy, I have ventured to express the opinion that the rarity of second attacks of communicable disease was due to the removal from the system, by the first parasite crop, of some ingredient necessary to the growth and propagation of the parasite."

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

TUNNEL.—Amador *Ledger*, 6: The contractor of the big tunnel at Middle Bar completed their contract Wednesday morning, making the distance over 2300 feet. The St. Julian one-stamp mill was started up again last Monday. The ten-stamp mill erected at Plymouth by John Evans has been started on the old dump-pile of the Alpine mine.

SUTTER CREEK.—Taking out the water from the Mahoney shaft is progressing favorably. There was about 300 feet of water when they commenced pumping; there is now about 100 feet in the shaft, with but very little tunnel below the water level. It will probably all be out this week. I am told that there are two or three parties with plenty of capital, anxious to inspect it, with a view of taking hold of it if satisfactory terms can be made. The McIntyre mine has come to a standstill. The developments fell short of anticipations, and prospecting has been abandoned. The company has expended considerable money in hoisting machinery, as well as underground work, and have apparently settled down to the conclusion that they have drawn a blank instead of a prize in the mining lottery. The Amador sulphurets works started up last week, with a fair supply of sulphurets on hand, with the prospect of an all-summer run before them.

Calaveras.

SOLD.—*Mt. Echo*, June 6: The Rasberry mine, adjoining the Stickle mine on the southeast was sold to Bechtel & Co., the other day for the sum of $4,000, and it is said that mining sales of much greater dimensions were consummated during last week. The company desire to purchase the mine owned by Mrs. Rice, adjoining the Rasberry mine. Preparations are being made to commence work in the Gold Cliff mine soon. Ten stamps have been added to the mill on the Invincible, making 20 in the aggregate. Look out now, for big results.

Inyo.

JUST THE THING.—Inyo *Independent*, June 6: About 100 tons of gold bearing sulphuret ore has been worked at the Maxim mill, to test the value of the Duncan Concentrator on that kind of ore. Mr. Stansfield says the success was greater with this than with the galena ore, highly satisfactory as that has proved to be. The working of the sulphurets is so complete that the yield of gold is very nearly equal to the assay value of the ore. Mr. Stansfield is now fully satisfied that with the Duncan Concentrator all the varieties of gold and silver ores found in Inyo county can be successfully worked.

INCREASED MILLING CAPACITY.—A new boiler is on the way from San Francisco for the Gavilan mine belonging to Cohen & Straus. The abundance of ore in sight in the mine fully warrants the owners in making this increase in milling capacity.

WATER SUPPLY.—One and a half miles of water pipe have been laid in Arastra canyon to supply water for Lasky's mill. This is a great improvement and will enable the mill to do much more work than formerly.

Mono.

BENTON.—Cor. Inyo *Register*, June 6: The Little Emily M. & M. Co., of Chicago, owners of the Laura and Eureka mines on Blind Springs Hill, paid off last week. This company, though a strong one, has been working only a small number of men during the past year, under the management of W. H. Russell, superintendent, and have most of their ore taken out on tribute or shares. They have a water-power two stamp-mill in Montgomery canyon which has been running for a couple of months; and if results prove satisfactory and the mines are placed on a paying basis, it is likely the company will push the work more vigorously. John Kremkow, with James Tregembo and Charlie Regli have purchased the old Kearsarge mine from August Mack. This was a good paying mine in early days, and large quantities of ore were taken out and shipped to Reno and San Francisco for reduction. The present owners are sinking a new shaft to strike the ore chimney on its southern dip, which was only followed about 150 feet in the old working. They have put up a new iron whim, and are now down about 100 feet. Since closing down last week, Mr. Millner has had the mill machinery overhauled and put in first-class order again, preparatory for another run. The mill starts up Monday on tailings. The driving power is a Corliss engine that used to run the old Comanche, and was one time condemned as worn out; but having been refitted and adjusted, it is now doing more and better work than it ever did before. It uses two and a half cords of wood where it used to take six, and running all the machinery—rock-breaker, five-stamp battery, four pans and settlers, and slum pump with steam to spare for the pans, etc.

Nevada.

BIG OAK TREE MINES.—Foothill *Tidings*, June 6: Mr. John Werry, the mining man of Colfax, was in town yesterday seeing about machinery for his mine, the Big Oak, near Colfax. Mr. Werry has been ill for some time, and has been entirely unable to attend to any mining business, but now he will be very active in that line. The Big Oak Tree is close to the Rising Sun mine, and is looked upon as a very valuable piece of property. The ledge is a very large one and already considerable ore has been taken from it and crushed, giving very satisfactory results. W. S. May, of Grass Valley, is engaged on the Big Oak Tree, erecting the hoisting works and pumping gear.

GOLD BRICK.—North San Juan *Times*, June 6: We saw at the store of Daniel Furth on Monday last a gold brick, the product of the Delhi mine for the month of May, which measured nine inches in length, four inches in width, two inches in thickness, and weighed a trifle over fifty-two pounds. Its value is about $10,400. The rock which produced this brick was taken from the 300-foot level, at which point the vein is eleven feet in width. Only the amalgamators were cleaned up. The mortars were not cleaned up, nor was the gold worked out of the sulphurets, of which there are several tons, that will yield at least $100 to the ton.

Placer.

THE MOUNTAIN GATE.—*Herald*, June 6: The old Mountain Gate drift mine, at Damascus, one of the oldest in the State, seems like good whisky, to improve with age. We are informed by a friend at Iowa Hill who knows, that for the month or four weeks ending May 23d, they took out 345 ounces and 9 pwt., worth $6,600. From the 23d to the 30th of May, they took out 97 ounces, worth $1,800. Their breast in the channel is 280 feet wide, and they take the gravel out from 10 to 14 feet bigh. They work only 20 men. The proceeds, according to the above figures, is about $13 a day to the man. It is in this same channel that the May Flower company are on, it is thought, some 20 miles or more below. Who can compute the amount of gold in a channel so rich, so broad and so long? The wealth of the Comstock in its best days only can compare with it.

Plumas.

MOHAWK ITEMS.—Plumas *National*, June 6: Mr. Thompson, of Alameda county, has a force of men at work taking out ore from his mine, and has contracted with Hapgood, Black & Co. for a test run of 50 tons in their mill. The Chamberlin, Flint & Co.'s tunnel is progressing slowly, having struck very hard rock. Hood, Neseman & Co. are pushing the Valentine tunnel. They have blasting rock.

San Bernardino.

CALICO DISTRICT.—*Print*, June 7: West Calico will soon be in the front ranks with its fine prospects and paying mines. Work on the Humbug is suspended for the present. Thousands of tons of low grade ore lie on the dump. The tunnel in the southeast end of the Gobbler is in about 70 feet and penetrates ore. The prospects of the mine are improving. It is reported that the Veto mine is opening up with a fine showing, and also the Sam Houston No. 1, under the management of H. T. Walker. The Silver Odessa is operating with the usual force of men, and is constantly striking bodies and veins of rich ore. From 10 to 15 tons of ore are taken to the mill daily, consisting principally of high grade. The Sue mines continues to show up well, and from 8 to 10 tons of ore are taken from the same daily to the Waterman mill. Sinking and drifting are progressing, and considerable prospecting is done with good results. Judge J. A. Owens has discovered a fine looking prospect on a claim that he recently located in West Calico, about 1,500 feet north of the Waterloo. We were shown a piece of good ore from the claim. He will proceed to open up the mine in good shape as soon as possible. He was offered $1,000 for an interest in the mine but refused. The Waterloo mine in West Calico, belonging to the Oro Grande Co., is looking well. An immense quantity of low grade ore is in sight that will mill at least $25 to the ton on an average, while chimneys of high grade ore are being opened that will mill into the hundreds, and occasionally into the thousands of dollars to the ton. Judging from appearances this mine will develop into a most valuable mine.

THE KERR MINE.—Messrs. Kerr and Patton have struck some very rich ore on their lower workings, and are putting some very high grade ore on the dumps. They now have an assayer on the ground, and are working their mine intelligently, as they know how ore goes by sampling daily. The Belle McGilroy group of mines are still working. The connection they have made shows a stope of ore for 125 feet; good looking ore all the way. They can now turn out large quantities of ore very fast. The Mozart group I understand are letting a contract to make a wagon road to their mines. This will be of great advantage as they can haul their ore for less than one third the price of packing. It is rumored that there is going to be a larger force put on these claims shortly. The Mescal mining camp has commenced to boom. About 20 pack animals of John Domingo are making daily trips from the Cambria mines to the mill at Ivanpah. I understand that the mill will start up under Barrett & McFarlane in about a week's time. Some old miners have taken leases on the old Ivanpah mines, and that section of the country is looking up again. Wilson Wadingham, the president of the Bonanza King Co., is expected here in a few days.

PROVIDENCE MINES.—Cor. Calico *Print*, June 7: Since my last, Caldwell's big ore team is making its regular trips. Everything is being pushed about the mill to start up as soon as possible. Mr. Hugn has gone to San Francisco to get some necessary machinery, and ere another week rolls by we will likely hear the glad sound of the stamps. The Bonanza Co. is taking out some very rich ore, and the dumps are being filled up. Miners coming in get work at once, and everything is looking up again. The assays of the first-class ore are as high a grade now as any time since the mine commenced work. Several contracts on the lower levels were let this week, and preparations are being made to put in new hoisting works with cages.

Shasta.

QUARTZ HILL.—*Courier*, June 6: The old Quartz Hill District four miles from here and on the east side of the Sacramento, bids fair to prove as rich in gold quartz as was anticipated by the enthusiastic men who first found gold croppings on the numerous ledges there a quarter of a century ago. The principal land-mark of the district is a huge pyramid of white quartz covering many feet of surface and towering above surrounding objects. The earth's surface for a great distance around the base of this pyramid is strewn with quartz rock, and the surface or placers worked in the vicinity paid enormously. At different times attempts have been made to work the quartz of the district, but heretofore little success has attended these efforts, either on account of the inexperience of the parties or the lack of sufficient capital to go ahead and develop their ledges. The failure of the Mammoth mill there twenty years or so ago, was due to the combined causes of lack of knowledge as to handling quartz machinery, and want of funds on the part of some of the stockholders. Parties are now at work and figuring in the district, through whose efforts, we have good reason to hope, the long delayed success will come, and Quartz Hill stand forth as one of the most prominent bullion producing districts of the county.

Sierra.

DAM.—Sierra *Tribune*, June 6: Dr. Thompson has constructed a dam which effectually impounds his debris. Water is getting scarce and he expects to clean up a nice sum, which will well repay him for the season. An Oakland company is operating on Howardc reek. Mr. Williams is superintendent. An incline shaft is sunk 110 feet to the bed-rock. The indications are favorable. A water-wheel and other machinery is doing effective work on the claim. Mr. Whitney has the contract for hauling logs to the Sierra Buttes mine. Men and team are already in the woods. At present they are felling trees, repairing roads and performing other necessary work before they commence hauling the logs to the brow of the hill near the mine.

Siskiyou.

FROM KLAMATH RIVER.—Cor. Yreka *Union*, June 6: A few lines from this mining camp on Klamath river may prove acceptable to some of your readers. There are in all six companies preparing to operate in the bed of the river. They have been busily at work the past two months building their dams and fixing up their machinery for hoisting and washing, and the work is now so well advanced that there is a good prospect that all will have commenced on or before the middle of June to take out the precious stuff. From last fall's prospects it is confidently hoped that the coming season will prove a prosperous one to the miners. A couple of miles farther up the river is two large China companies starting in, one on the Freshouer bar and the other on the Lime gulch bar. Above them about a mile comes the celebrated McConnel claim, below Humbug, which is already in full operation. As all of these companies, when they commence washing, work a good many men, from 12 to as high as 50 each, the camp has a busy look through the season. I will state that the hired help will be mostly Chinese.

SALMON ITEMS.—About three weeks since Mr. Lovejoy discovered, on Summer trail from the South fork of Salmon to Hoopah valley, a ledge of gold-bearing quartz, which is said to be from 65 to 70 feet wide, and will pay from $8 to $15 to the ton. There is a good water privilege within a good quarter of a mile from the ledge. The trail, which in early days was used as a pack trail, crosses the ledge, and it is strange that so large a body of quartz should remain undiscovered so long. It is situated about one mile and a quarter on the other side of the Siskiyou county line, in Trinity county. If this report be true the Salmon country will soon be the banner section, and will be thronged with prospectors from all sections of the country. At present there are some 30 men on Methodist creek, mainly prospecting for quartz, and three ledges have been struck. One of them the old Indian ledge, has been struck 900 feet below the summit, and is two feet in width, and prospects well. On Plummer creek Mr. Donaldson and others have a nice ledge which goes from $35 to $40 to the ton, and is improving as they go down on the ledge. Mr. Donaldson informs us that, in his opinion, there is better prospect for finding good paying ledges on this side of the summit than have or ever will be found in the New River section. At the Black Bear mine they will soon put on a few more men to get out 200 tons of quartz.

Trinity.

VIEWS ON NEW RIVER.—Trinity *Journal*: Leaving Eureka, Humboldt county, for the New River mining district, the traveler proceeds by boat and rail a distance of 25 miles, and then by trail to the mines 80 miles further. The trail on this route is a difficult one, and aside from being poorly laid out is easily lost in many places, on account of many other trails running to the right and to the left. Although we were disappointed in not finding greater excitement and more business in the New River section, yet on inquiry it was found that a combination of circumstances contributed to this quietude, and it was not because of any lack of paying ledges or good discoveries. The district is laboring under the same difficulties which some of the richest districts of the coast have passed through. One is the want of capital, and another the desire on the part of many to gobble up the whole country, making innumerable locations and doing no work on them. While scratching on the surface and sinking a few feet is plentiful, the developed and paying mines are few. Those men who discovered ledges and went to work on them in true mining style have in every case developed paying mines and been well rewarded for their labors. The formation of the country is granite, porphyry and limestone, and in many cases contact veins are found, that is veins lying between two formations, and these are almost always the most permanent and richest. The ore for the most part is gold-bearing quartz, easily extracted and easily milled. The veins are not large but in several instances very rich. In size they vary from a few inches to four feet in width. Never in a mining district have we seen richer white quartz than is here shown. When proper attention is shown to the many ledges existing in this district, a grand future will be opened up for it. At present there are not many mines being worked, nor many men employed, and as a consequence the settlements are rather dull. The country, however, is full of prospectors and new strikes are frequent. Many go there for the purpose of preying on the earnings of the miners and come away disappointed. This class always gives the place a hard name. The principal mines in operation are the Hard Tack, a true fissure of good size and carrying very rich ore; the Uncle Sam, with a 5-stamp-mill and arastra attachment; the Mary Blane, an extensive property employing 16 men and running a 5-stamp-mill day and night; the Ridgeway, a very promising mine now crushing ore at the Uncle Sam mill; the Grover Cleveland, on Eagle creek, is fast coming to the front, and there are many other good locations awaiting developments. Miles Finlen, formerly an official of Virginia City, Nevada, is at White Rock running an arastra for the purpose of testing ores, and will ere long erect a stamp mill if the ore from the various mines justify it. Taking all things into consideration, there is a bright and promising outlook for the New River region, no matter what disappointed croakers may say. Taking the trail at White Rock, which leads over the mountain by the Mary Blane mine, we reached Weaverville by easy stages. This trail has been lately built, and is the best mountain trail we have ever traveled. The distance from New River to Weaverville, over this route is less than 50 miles, and 43 miles from Weaverville to the railroad at Middle creek, a station near Shasta. This is by far the most easy and available, as well as cheapest route to or from the mines. Notwithstanding mining has been carried on in Trinity county for more than 35 years, it may be said to be in its infancy. There is plenty of gravel rich in gold that has not yet been touched. Vein mining has been little sought after until within the past few years, and is only now beginning to assume the importance which its richness and extent should long ago have commanded. The country lying between Weaverville and New River is not equaled in California as a field for the intelligent prospector. Mammoth veins crop out in abundance all along the route, and as the beds of the streams have all paid for sluicing it stands to reason that the ledges of quartz which over-top them should also be rich. Yet but little attention has been paid to the prospecting for veins.

NEW RIVER MINES.—Grass Valley *Union*, June 6: Frank Taylor returned from a trip to the New River mines, in Trinity county, on Friday evening. He went by way of Redding, taking a riding and pack animal. He found that there were about ten quartz mining operations going on in the district, one company having a 5-stamp-mill, the others reducing their rock with arastras. About 5,000 people had been in the district, first and last, and some hundreds at the present time. The country is exceedingly rough, being broken into canyons, with scarcely any level land. New River heads in Scott Mountain, and on the broken sides of this mountain the mines are situated. The houses that have been put up are generally substantial structures, built of sugar pine, as owing to the heavy snowfall it is necessary to make them strong. As much as 15 feet of snow falls in winter. The quartz ledges are generally small, about 6 inches in width, and although ore of fair quality in some of the veins has been found, the opinion of experienced vein miners is, and they are there from nearly all the quartz districts of the coast, that the mines will not amount to much, and that the whole excitement has been engineered by the coast towns, Arcata and other places, to make business. Mr. Taylor's opinion is that the New River mines are a fraud, in the sense of being such as to encourage people to leave other places to go there, and that right here at home there is a better field for prospectors, and more chances of opening good mines. His advice is to keep away from New River. It is an undeveloped and very rough country, expensive to live in, and no place for those seeking employment by day's labor at mining.

Tuolumne.

SOUTH END OF THE COUNTY.—Tuolumne *Independent*: Mr. Fischer is still operating on the Butler mine at B. O. Flat. He has a shaft down some 60 ft. and expects to strike the vein shortly. The Blue Lizzard at Groveland, is still paying quite well. Messrs. McLain and Miller recently took out a large pocket, near Spring Gulch.

NEVADA.

Washoe District.

HALE AND NORCROSS.—*Enterprise*, June 6: On the 3,000 level the principal work being done is the chambering out a station in the 15-foot ore vein cut through by cross-cut No. 2, west. This will be completed to-day, and sinking the winze commenced, to follow the ore vein below that level and ascertain its true merits. A very fine face of ore is developed for a starter, that shows well in rich bunches and streaks of black sulphurets, and the whole will average $60 or more to the ton. This is being taken to the surface as fast as extracted, or when the hoisting facilities of the Combination shaft will allow, and will be continued. About 40 tons of ore are on the dump already. It has been several years since pay ore bas been hoisted from the Hale and Norcross. No trouble is anticipated from water in this deeper sinking, as the pumps have full command of the situation and keep the water reduced with perfect ease. On this same level cross-cut No. 1 west is in 140 feet, and shows a vein of fair grade ore cut through, about 15 feet in width, showing spots of ore giving high assays. This will be drifted laterally upon shortly in order to ascertain its merits as a good paying proposition. The main lateral drift north on this level has been advanced 40 feet during the past week, and its face is about 150 feet from the Savage line. Nothing doing on the 2,900 level. On the 2,400 level the spacious new air gallery is in 100 feet from the main incline winze, and 60 feet further will carry it through to its connection with the northwest drift running to the Savage incline. This will take about a week, when the much-desired and required circulation of air will be established.

CON. CALIFORNIA AND VIRGINIA.—The stopes on the 1 700 and 1,750 levels continue their liberal output, nearly 700 tons being extracted during the past week, assaying about $15 per ton as against $22 per ton the previous week. The main lateral drift north on the 1,700 level is being extended at the rate of about 45 feet a week in favorable working ground. From the Jones lease section, between the 1,200 and 1,550 levels, over 100 tons per day are being extracted, assaying $18 per ton. The old Con. Virginia shaft was turned over to Jones yesterday morning, together with surface machinery, etc. The shaft has been partially repaired, sufficient for ventilation purposes, and it may be put in order for hoisting if found requisite. Rumors of strong improvement in this mine have been prevalent during the past three or four days, confirmed by the sharp rise in stock, but denied by official authority. The average ore assays show the reverse of improvement.

CHOLLAR.—On the 3,000 level the main south lateral drift is being extended, and when the proper point has been arrived at, it is the intention to start another cross-cut, No. 4 west, to intersect the ore vein further south. Cross-cut No. 3 is still advancing in mixed vein matter, clay and quartz, with spots and streaks of ore.

BEST AND BELCHER.—On the 1,000 level, the Gould and Curry and Best and Belcher joint east drift is progressing at the rate of about 50 feet a week. The main north lateral drift on this level is being put in good state of repair.

OPHIR.—The upraise above the 500 level, to connect with and drain the old Mexican shaft, is up 60 feet, and the joint cross-cut of the Ophir and Mexican, on this level, is making good advancement.

WOODVILLE.—On the 400 level, five or six tons per day of good paying ore are being extracted. It is proposed to run a drift from this level into the Justice mine for ore explanation at that point.

CROWN POINT.—The old stopes continue their regular yield and show no sign of exhaustion. The

same may be said of Belcher, which is worked through this mine.

ALTA.—Good bunches and stringers of ore continue to be met with in the explorations and upraise above the 950 level. This upraise is in the foot-wall and extends to the 800 level.

OVERMAN.—On the 226 level a considerable amount of low grade ore is found, and about a dozen tons per day is being extracted through the old Petaluma street tunnel.

MEXICAN.—The joint Mexican and Union drift on the 500 level and also the west cross-cut from the main north lateral drift on that level, are both making good progress.

YELLOW JACKET.—Extraction of low grade ore from the old upper workings goes on as usual, the stopes and breast looking and yielding well.

BULLION.—The main drift west on the 160 level is progressing well in good working ground, with favorable ore indications.

KENTUCK.—Ore extraction from the old upper levels continue as usual.

Columbus District.

MOUNT DIABLO.—*True Fissure*, June 6: The west drift on the sixth level has advanced 15 feet during the week, and the winze from the west drift on the fifth level is now low enough to met this drift. Consequently work has been stopped until connection is made with the sixth level. The east drift on the sixth level is in 51 feet, and the east drift on the fifth level is in 139 feet. The stope above the west drift on the fifth level is looking well. The intermediate stope, between the fourth and fifth levels, shows a strong ledge of $60 ore. The north cross-cut from the west drift on the fourth level is in 28 feet. The west drift on the third level shows a foot of $100 ore and looks well. The stopes between the second and third level shows no marked changes. Some very rich ore is being taken from small streaks between the first and second levels. The remaining portions of the mine show no special changes.

Eureka District.

LOCAL NOTES.—Eureka *Sentinel*, June 6: Considerable prospecting work is being done in the mines on Adams Hill. Prospect mountain properties are attracting quite a number of tributers just now. Several new leases of mining properties in various parts of the district have been made to miners lately. The Jackson mine on Prospect mountain sent down to the Eureka Con. works during the past week 26 tons of ore. The Lord Byron mine in Prospect mountain shipped 16 tons of ore to the Richmond works during the past week. The Dead Broke mine on Prospect mountain made a shipment of two and three-fourths tons of ore to the Eureka Con. furnace last Thusday. The Blue Ruin mine in Silverado has again commenced shipping ore, and during the past few days five tons were sent to the Richmond furnaces. The Mathewson Bros. brought in from some properties near Hamilton to the Eureka Con. works five tons of very good ore during the past week. A shipment of seven tons of ore was made to the Richmond works during the past week from the Monte Cristo in Robinson district, White Pine county. The prospects of the Silver State mine on Prospect mountain developing into a producing property of no mean proportions are said to be flattering. Maurice Hartnett made a shipment of one and a half tons of ore from the Industry mine on Prospect mountain to the Eureka Con. reduction works the other day. The Dunderberg mine on Prospect mountain continues to look well. A shipment of five tons of ore was made during the past week from the property to the Richmond works. The Alexander mine in Prospect mountain has made some very good shipments of ore to the Eureka Con. works during the past week. Since Monday last 32¼ tons were shipped. Some of the pitches in the Albion mine look well, and several of the new tributers working in them shipped to the Eureka Con. works during the past week nearly 20 tons of very fair ore. Several of the mining properties in Newark valley are looking and producing well. During the past week the Bay State shipped 19 tons and the Scasso also made a shipment. Both shipments were to the Richmond. Several weeks ago the Silver Connor mine on the west side of Prospect mountain took the lead of ore-producing properties in that section, and since then it has maintained its stand nobly. During the past few days 56 tons of ore was shipped from the property to the Richmond works.

Osceola District.

GOLD DIGGING.—Salt Lake *Democrat*, 6: Mr. John Reeves, general agent of the Utah Central, has returned to Salt Lake from a two weeks' visit to the mines of Osceola and Taylor districts, Nevada. Upon inquiry a reporter learned that the Osceola Gravel & Mining Company are working extensive gravel beds of placer gold by the hydraulic process, with apparent great success. In the same grounds placer mining has been carried on by the panning and rocking processes for some years, and there are yet a number of men following the old primitive methods. There are also quartz mines in the vicinity of the gold gravel beds, which are yielding good ore, with prospects very promising. One quartz mill about two miles from Osceola, is being put in shape for active work. It is reasoned that if a single man by the old rocker process can take out from $5 to $10 of gold per day, what will be the limit of the company with their modern hydraulics now working six nozzles, and using twice over the continuous supply of water from the large 14-mile canal. Surely immense wealth lies in store and an undoubted source of great profit is guaranteed each member of the company. Large nuggets are found frequently, one weighing 24 pounds having been found which averaged $17 per ounce. The gold is of good, pure quality, assaying high, and easily obtained since the full head of water has been secured. The company in which Messrs. Godbe and Hampton are interested propose to rush matters from now on.

Tuscarora District.

BELLE ISLE.—*Times-Review*, June 5: West cross-cut, 350-foot level, is passing through a favorable formation, and was extended the past week 14 feet. North drift on the west lateral, 150-foot level, advanced 8 feet; total length, 75 feet.

GRAND PRIZE.—The 200-foot level south has been extended 17 feet during the week. The upraise above the 200 is up 55 feet. The 300-foot level has been extended 30 feet during the week, and the upraise above the 400 is up 86 feet. Progress for the week, 48 feet. Stope above 200 looking well. Mill will start up in a day or two, as soon as the pans are ready. Everything else is ready.

NAVAJO.—Drift south and cross-cut east on the 650-foot level have been extended 46 feet. Upraise has been carried up 31½ feet. On the 350-foot level the drifts have been advanced 63 feet. West cross-cut, 150-foot level, extended seven feet—total 193 feet—and work suspended for the present, on account of the indications of a strong flow of water. In the Johnson cross-cut east, same level, a drift has been started north, for ventilation, to connect with the drift that is being extended south on the east vein.

White Pine District.

MILLS.—White Pine *News*, June 4: The mills are being run with as light forces as can possibly be got along with. Not near the number of men are employed that were last fall.

ARIZONA.

SILVER ORE.—Prescott *Courier*, June 5: Wm. R. Morgan has just brought to Prescott another lot of rich silver ore from the Pine Spring mine. Supt. Chase worked 80 tons of the Wonder ore, in one of his mills. Result satisfactory. Messrs. Roach and Holmes, have $20,000 worth of ore that will pay between $400 and $500 a ton, ready for shipping to Pueblo, Colorado. It is said that Mr. Eaman proposes to work the Black Warrior mine, Peck district. The 10-stamp mill recently erected near the head of Big Bug creek, for Mr. Scofield, by Messrs. Church and Gray, is doing excellent work. There is no attempt at battery or plate amalgamation. The pulp goes direct from the stamps to a long tank, where it is separated by the action of water and carried to jigs and shaking tables. Different ingredients go towards the tailing pile by different routes, but the valuable portions of the rock are saved in pans. Tests go to show that but little of the gold goes into the tailing pile. The mill is not a costly one; but it is, nevertheless, just what is needed to treat certain classes of Big Bug ore.

COLORADO.

SAN MIGUEL.—*Journal*, June 4: Notwithstanding the past winter was a comparatively mild one, yet the spring opens late, owing to continued severity of the storms since March 20. But, at last we are able to announce the resumption of mining in earnest, and the shipping of ore, and from observations we feel no hesitancy in predicting for the San Miguel an extraordinary prosperous season. Corporations have experienced no difficulty in securing ample funds to prosecute the season's work, without cessation, and before snow falls again many more paying mines will be listed from this section. So far, the principal paying mines are those of Marshall basin, but there are, in adjacent basins, many others equally as good, particularly those of Ingram, Bridal Veil and Bear Creek. In Marshall basin work has been prosecuted with reasonable diligence, although the number of men employed, and the work that has been accomplished is nothing in comparison with what is contemplated for the summer. In this basin are some of the best mines in the State, in which are exposed thousands of tons of high grade mineral. During the winter, owing to a want of ore houses and other facilities for handling and sorting the mineral, it has been left standing, no more being removed from the mine than was absolutely necessary. In Ingram basin are located, and partially opened, some of the most extensive bodies of galena in the San Juan. The ore is quite low grade, and would not permit of shipping heretofore, but will pay handsomely with our reduced cost of transportation, as the immense veins necessitate the handling of no waste dirt. In Bridal Veil are several properties that will produce ore this season. A greater part of the locations in this basin were only recently made, yet, with a small amount of work done enough has been demonstrated to very clearly establish the fact that those who own property in that section will reap a rich reward for the time and money expended in their search for it. Bear Creek will be unusually active this season, and in all probability the year around hereafter, as there is no occasion for shutting down work as soon as the first snow falls.

BRIEF NOTES.—Georgetown *Courier*, June 5: A streak of 700-ounce ore has been struck on the Saco lode. W. C. Roberts and Jake Blair, on the Blue Bell lode, Kelso mountain, are taking out some good ore from the 30-foot adit. D. R. Holbrook commenced work last Monday upon the Detroit lode, Kelso mountain. He intends driving the 290-foot level ahead. There is a two-inch streak of mineral in sight which runs from 200 to 600 ounces. Peter Divinney and brother brought down 56 sacks of ore from the Astor mine last Saturday, which was extracted in development work near the tunnel level. The first-class returned 960 ounces, second-class 270 ounces, and third-class 70 ounces silver per ton. A 280-foot cross-cut is to be commenced soon to cut the Josie Meeker vein. The lessees on the Wolverine have from two to four inches of ore in their stope. Three parties of lessees are engaged on the Nyanza mine. Lacy & Co. are sinking a shaft 500 feet from the mouth of the adit, and are down 40 feet. From one to two inches of fine mineral is exposed in the bottom. O'Connell & Co., 100 feet farther west, are also sinking, and are down 75 feet. They are taking out 267-ounce ore. Ray & Co. have from three to six inches of high grade mineral in the 60-foot level. Cooper & Co. are taking out large quantities of mineral from the Lucky-Hesperus. McVeaty & Co. are drifting on from three to six inches of rich ore in the Fred Rogers. They are building a new ore-bouse at the mouth of the tunnel. A fine specimen of ore, weighing 125 pounds, was recently taken from Owsley's lease on the Cascade. Large jack-trains are kept constantly employed conveying ore from Cascade district to market, and although every available animal is at work, the force is not sufficient to handle the output of that section. The cross-cut being run on the Summit will intersect the shaft in a few feet. A dam is being put in at the mouth of Hukill gulch for the placer mining purposes. Harris & Kelso, who have been crosscutting for the Flagstaff lode, have passed through a porphyry dyke into a mineral vein.

IDAHO.

THE ELMER.—Wood River *Times*, June 3: George H. Merrill came in from Smoky yesterday, bringing for assay samples of carbonate and galena ore carrying native silver which he procured from a ledge on the Galore belt, below Pierce Dorgan's claims. This ledge was discovered about two weeks ago, and located by Abrahani Bellin, Anton Ellexson, and George H. Merrill. It crops out on the surface, quite prominently, carries three feet of pay ore, of which a streak of 15 to 18 inches is rich. Mr. Merrill says the croppings must have been seen before, but that the value of the ore could not have been ascertained by those who saw them, or the claim would have been located. The owners of the Elmer that is the name of the claim—will begin shipping ore soon after the Smoky wagon-road shall be completed.

ENORMOUS ORE-BODIES LYING IDLE.—Eph. Daft and wife returned this morning from their visit to the Lava and Blackburn mining districts. The Martin mine, in Lava district, shows enough ore already to make its owner independently rich. The Blackburn district mines show up an enormous width of ore-vein, with large quantities on the dump.

ANOTHER IMPORTANT STRIKE.—Wood River *Times*, June 3: News comes of another important strike on the Horn Silver belt, out in Lava or Champagne district. It was made on the Rattlesnake claim, which is situated about 3000 feet south of the Horn Silver or "Martin" mine, as it is generally called, and promises to fully equal the showing of that famous property. The Rattlesnake is owned by William H. Walker, A. W. Crawford and Wiley Jones.

A GOOD REGION FOR PROSPECTORS.—M. J. Calnan, a well-known prospector, was in town last Saturday from the Soldier Boy and Silver Crown group of claims, on the East Fork of Wood River. He has done over $8000 worth of work on the claims, and has a good deal of ore in sight—from which he will drew in future for development funds. Mr. Calnan belicves the East Fork to be the most favorable locality in the northwest for prospectors.

THE HORN SILVER MINE.—Yesterday afternoon, Mr. Martin, owner of the Horn Silver mine, showed Geo. W. Faylor a dispatch which stated that the examination of his mine was satisfactory, but Mr. Faylor does not know who signed the dispatch, nor whether it ment that the sale which has been under way would be consummated. Two well-known mining men have visited the mine during the past three weeks in the interest of syndicates of mining capitalists. One was Pat Mervin, ex-Snperintendent of the Ontario mine, who came in the interest of the Chambers-Gilmer & Salisbury-Haggin-Hearst crowd; the other was Colonel Hardy, formerly superintendent of the Ophir and other leading mills and mines of the Comstock, who came in the interest of the Alvinza Hayward and W. S. Hobart crowd, of San Francisco. Both expressed the opinion that the mine was a valuable one. But which of the two it is that telegraphed yesterday is not known. The price asked for the property is stated to be $275,000.

MONTANA.

BANNACK MINES.—Cor. *Inter-Mountain*, June 5: The Blue Wing property improves with depth, and continues to ship a large amount of from 100 to 300 ounces silver ore. Mr. Hays has purchased the old smelter and grounds above town, and expects to have a water jacket furnace working by the 10th of July. The Czar mine, owned by John Stigirs & Co., is being worked by leasers, and they are doing well. The Charter Oak mine has a fine showing of rich mineral. The Carolina mine, on Steel creek, has been leased and bonded to some Butte gentlemen, who are now working a number of men on good pay. The old Huron mine is again producing a quantity of high grade ore. Coloradoans are becoming numerous in this camp. Three different parties visited the Lost Cloud mine, near Bald Mountain district, the first of the week with a view of purchasing. Phil Shennon got away with the cake. Considerable prospecting is being done in Elk Horn and Bald Mountain districts. John Carhart and Phil Shennon's stamp mills are running on gold ores. The Ruby mine, owned by F. L. Graves & Co., has started up. The Silver Rose mine, owned by L. Hamilton & Co., is producing a quantity of good mineral. About 1,300 sacks of ore have accumulated at the Polaris, Silver King and Lost Cloud mines, in Bald Mountain district, owned by Dr. Meade and Cochrane & Co. James Harby has purchased the Cumberland mine, and will open it up.

NEW MEXICO.

GRANT COUNTY MINING.—Deming *Tribune*, June 6: Amos Green is here from his mines at Pyramid. He is making arrangements to ship his ore here to the Pueblo Sampling Works. Jimmy Hough leaves to-day for his mine in the Tres Hermanos district, where he proposes to pass the summer getting out ore for market. Mr. Orr is in from his mine at Cook's Peak. He has been shipping considerable carbonates of late. His ore seems about 50 per cent lead and about fifteen ounces silver. Albert Taylor, who recently purchased the Gen. Hancock mine, in the Tres Hermanos has sold a quarter interest in the mine to some capitalists in Rock Island, Illinois. This augurs well for this district. The Pueblo Smelting Works will keep running night and day. Mr. Forman, the superintendent, is winning golden opinions by the way he runs his sampling works. Mr. Roony, his assayer, is also a great favorite. We understand that Mr. Pearson intends to start up the smelter soon on ore from Stein's Pass and San Simon. Some work will have to be done in making a dust chamber before the smelter will blow in. Mr. Pearson informs us that the Bessie mine alone can help the smelter running. The ore is very fine and an easy fluxing ore. There is talk of a very rich find on this side of the Cook's Peak range, right in sight of Deming, about ten miles north of here. The croppings and float are very rich, all covered with green horn silver and native silver. The discovery is kept very quiet, and, with the exception of the parties directly interested, the public cannot find out where the mine is. The ledge is a blind one, and the discovery was accidental. The Victoria mines, namely, Head & Hearst mine, and the St. Louis company, are both pushing matters to their fullest capacity. This mine has been to the Benson smelter what the Kelley mine is to the Socorro smelter, and is one of the best paying mines in the southwest.

OREGON.

NOTES.—Jacksonville *Times*, June 4: Considerable prospecting is going on in different portions of southern Oregon. Jas. Lawrence has returned from a prospecting trip in the Sucker creek district, Josephine county. A boom has started at Galice creek, Josephine county, which promises to extend. Much prospecting is being done, and many claims are being located. The Sterling Mining Co. has quite a force of men engaged in building its huge reservoir, which will be 250 feet wide, half a mile long and 50 feet deep. Notwithstanding the unfavorable mining season a considerable quantity of gold dust has been taken out. C. C. Beekman alone has bought and shipped several thousand dollars' worth. On the 13th ult. the well-known Star gulch mining property will be sold at an administrator's sale. The ditches, water rights, pipe, etc., and everything appertaining to those mines will also be sold. Two tunnels are being run at the Yank ledge, under the management of N. McNair. A considerable amount of all kinds of supplies for the work were lately received direct from San Francisco. A number of men are employed there and a boarding-house has been opened. N. McNair and Henry Hutchins, of Galice creek, were at Grant's Pass last Saturday, and confirm the reports of the rich propects at the Yank ledge. We saw some rich ore from there, which leads us to believe that Galice creek will prove a good mining camp in the near future.

MORE PLACER FINDS.—From a gentleman who came in from Sparta last evening, we glean the news that exceedingly rich placer discoveries have been made the past few days on what is called Saw Mill gulch, about one and a half miles below what was once Gem City, and about three miles from the town of Sparta. In former years claims were worked near the head of this gulch that paid well, but down the gulch, toward its mouth, very little if any attention to its working. Now it appears that two men by the name of Nelson and Beard prospected at this point in the gulch and their endeavors have been crowned with what promises great success. Our reliable informant states that he himself panned out one pan of dirt and got upwards of twenty-five cents. Other parties done equally as well. One party found on the top of the ground a specimen of gold as large as a good sized bean. People from the surrounding neighborhood are greatly excited over the finds and are securing locations as fast as possible. Water for these diggings is to be had from the Eagle Creek canal which can furnish upwards of 1500 inches of water daily. At present the old-time "rockers" are brought into requisition and enables the locators to make good daily wages and not much expense attached.

GOLD.—Bedrock *Democrat*, June 3: Stories of rich gold finds are of nearly every day occurrence of late, and though some of the finds are greatly exagerated as the news passes from the lips of one to another, most of the reports have a great deal of foundation. But the latest reliable report we have now to chronicle, which surpasses the stories often related in early days regarding gold growing on the sage brush. It is the more wonderful from the fact that it is the naked truth, as we have interviewed several parties direct from the camp where the gold was found who vouch for the truth of our statement. A couple of days since, Mr. Thomas Graham, of Granite Creek, 45 miles southwest of this city, while mining his placer claims, picked up a gold boulder, which afterwards being weighed, netted four and one half (4½) pounds—equal to between $800 and $900. Mr. Graham has worked his placers for many years with considerable success, often times picking up nuggets weighing from one dollar to fifty dollars, but had little idea that he would be so fortunate as to make a find as large as this one, though in his dreams he may have had a presentiment of such glowing riches. This large piece of gold will be brought to this city and put on exhibition in a few days. Granite Creek is one of the oldest camps in the State, and one of the richest, every year turning out thousands of dollars to the hardy miner as a recompense for their industry. The gravel beds have deep deposits, and the gulches are wide and lengthy, coarse gold permeating mother earth in all directions. The water supply of the camp is very good and the seasons of working very lengthy. Many valuable quartz discoveries have also been made in this district and the ores assay very rich. Parties who have quartz locations here are this spring pushing the work of development to a considerable extent. In fact Granite district is one of the richest mineral sections of Eastern Oregon.

UTAH.

REVIEW.—Salt Lake *Tribune*, June 5: The receipts of bullion in this city for the past five months of the current year, excluding all ore receipts, and not including some of the producers which make no reports till the close of the year, have been $1,529,556.73. The week that has just passed has fairly inaugurated the hot season. The movements of the metals have been fair, and though the Decoration Day holiday was included in the week, the totals are satisfactory. The receipts of bullion and ore in this city for the week ending June 3d, inclusive, were in aggregate. $92,754.78 of which $79,934.78 was bullion, and $13,720 was ore. The receipts of the week previous were $86,118.95, of which $76,482.88 was bullion, and $9,636.07 was ore. The Ontario shipments for the week last named were 87 bars of bullion, of the value of $49,715.21, bringing the total shipments for the year to date, up to $695,701.29. The Christy sent up from Silver Reef three bars of silver, valued at $5,700, for the week ending the 3d inst. One hundred shares of Stormont stock sold in New York on the 23d May for 12c. The Hanauer smelter produced during the week nine cars of bullion, $19,300. The product for the Germania during the week was two cars of bullion, $5,319.57. Sales of Alice stock in New York are reported. Ore receipts for the week were to the value of $2,600 from the Crescent, and $8,520 from the Honerine, both of Utah.

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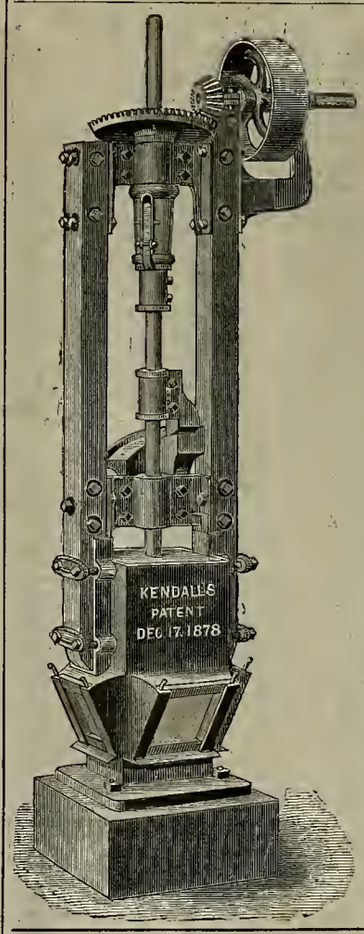

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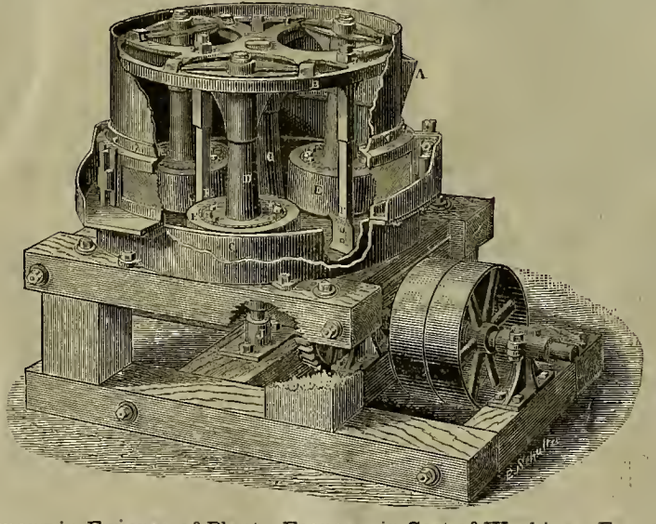

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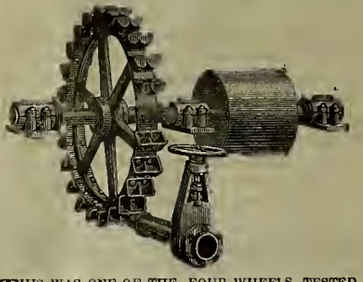

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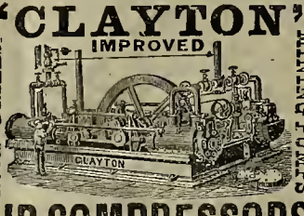

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Mr. Robbins has almost the exclusive trade of the Pacific Coast in this line for fruit and salmon canneries. The tools are made for this State, Oregon, Washington, Mexico, and even the high protective tariff of British Columbia does not prevent that market being supplied from this city. A great deal of trade is also done with Australia, Mr. Rohbins having fitted out several canneries there engaged in meat and fruit packing.

A specialty is also made of soap-making machinery, which consists mainly of presses, molds for casting soap, dies for marking, etc.

Special machinery is made for the manufacture of hydraulic pipe, such as punches, shearing tools, etc. A great deal of this wrought iron pipe is made on this coast, and Mr. Rohbins furnishes the necessary tools.

This is a different line of business from the general machine shops. In fact, the proprietor had so much difficulty in getting ordinary machinists to do the work, that he had to break in apprentices who have grown right up with the business. Mr. Robbins started his shop in 1876. He had to have special tools to make this machinery, and as some difficulty was experienced in getting them to suit, he had to make most of them in his own shop.

In addition to the specialties mentioned, Mr. Robbins does considerahle work in the line of shafting, pulleys and hangers, in fitting out such places as need these articles.

The shop is just now engaged in fitting out a new factory at Ventura for making five-gallon oil cans. Altbough called five-gallon oil cans, they are really intended to contain honey. He had previously made a set of tools for this purpose for a Los Angeles factory.

A short time since Mr. Rohbins moved into his present convenient quarters in the new huilding, Nos. 221 and 223 First street. As regards cleanliness, light and convenience this is one of the "pattern shops "of this city. Every thing is handily arranged, and the whole shop is remarkahly clean and neat, looking entirely different in this respect from most machine shops. Numerous windows give an ahundance of light.

Mining Share Market.

Mining stocks have been rather active this week, nearly all the leading Comstocks coming in for their share of patronage. The prospects in the middle mines are improved.

The recent flood of hot water consequent upon the breakage of the big hydraulic pump at the Combination shaft, was exceedingly detrimental to the submerged lower levels, causing swelling of the ground, breakage of timbers, runnings and cavings of the ground, etc., necessitating the expenditure of considerable time and expense in repairs, but this being completed, the work of development was resumed, and is advancing from its last status before the flood. A winze has been started from the 3,000 level of Hale and Norcross, at the most eligible point in the ore vein, to follow it below that level. This is the most important and significant movement which has been made for some time, and in fact it may be considered the most important yet made in the central portion of the Comstock, as tending to the development of the famous old lode below 3,000 feet in depth, at that point, which is the very heart, the tap root, so to speak, of the Comstock.

Development work is advancing well and favorably in Chollar, also, on the 3,000 level, and the continued effective working of the big hydraulic pumping arrangements gives full confidence that no further trouble will be experienced from that quarter.

The low grade ore resources of the old bonanza sections of the north and south ends of the lode, in Consolidated California-Virginia and Crown Point and Yellow Jacket, are being worked for all they are worth, and steadily continue their regular output of ore.

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Alta S M Co	Nevada	32	25	Apr 30	June 4	June 24	W H Watson	302 Montgomery st
Baker Divide M Co	California	9	25	May 12	June 15	July 6	D M Kent	330 Pine st
Best & Belcher M Co	Nevada	32	50	June 2	July 9	July 28	W Willis	309 Montgomery st
Chollar M Co	Nevada	16	50	May 11	June 24	July 15	O E Elliott	309 Montgomery st
Con Imperial M Co	Nevada	22	10	May 20	June 20	July 15	C L McCoy	329 Pine st
Champion M Co	California	19	08	Apr 23	June 1	June 19	T Wetzel	622 Montgomery st
Caledonia M Co	Dakota	16	15	May 28	July 10	Aug 5	W L Oliver	328 Montgomery st
Eintracht Gravel M Co	California	18	05	May 26	June 30	July 18	H Kuuz	209 Sansome st
Endowment M Co	Nevada	5	50	May 19	June 22	July 20	E M Hale	327 Pine st
Golden Fleece G M Co	California	1	20.00	Apr 18	June 8	June 27	F Schirmeier	Phelan Block
Gould & Curry M Co	Nevada	53	40	June 1	July 8	July 29	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	85	50	May 9	June 9	June 29	E B Holmes	309 Montgomery st
Iowa M Co	Nevada	17	05	Apr 29	June 6	June 27	C C Leavitt	510 Battery st
Loreto M and M Co	Mexico	08	15	Apr 28	May 29	June 22	H G Jones	327 Pine st
Mayflower Gravel M Co	California	30	40	June 4	July 20	Aug 11	J Morizio	328 Montgomery st
Mexican M Co	Nevada	55	20	Apr 20	May 23	June 13	G D Edwards	414 California st
Navajo M Co	Nevada	11	25	May 25	June 29	July 20	J W Pew	310 Pine st
Pay Day M Co	Nevada	3	02	June 6	July 14	Aug 10	W Van Bokkeless	419 California st
Potosi M Co	Nevada	18	30	May 13	June 19	July 10	C E Elliott	309 Montgomery st
Puget Sound Iron Co	Wash Ter	11	50	Apr 14	May 25	June 25	A Halsey	328 Montgomery st
Peerless M Co	Arizona	4	30	May 18	June 23	July 17	A Waterman	309 Montgomery st
Santa Anita M Co	California	8	02	Apr 23	May 26	June 16	J M Buffington	309 California st
Sierra Nevada M Co	Neva a	82	25	June 9	July 15	Aug 4	E L Parke	309 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Alpha Con M Co	Nevada	W Willis	309 Montgomery st	Annual	June 15
Bodie Con M Co	California	G W Sessious	309 Montgomery st	Annual	June 15
Mount Como M Co	Nevada	E S Salomons	331 Montgomery st	Annual	June 15
Nor h Belle Isle M Co	Nevada	J W Pew	310 Pine st	Annual	June 20
New Era G M Co	California	A L Fuller	413 Montgomery st	Annual	June 13

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Kossuth M Co	Nevada	C K Sturtevant	328 Montgomery st	06	Mar 16
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	20	May 28
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Feb 13
Plymouth Con G M Co		W Van Norden, Pres	23 Nassau st, N Y	50	Apr 6
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Feb 16
Syndicate M Co	Nevada	J Stadfeld Jr	419 California st	10	May 5

PACIFIC COAST WEATHER FOR THE WEEK.

[Furnished for publication in this paper by NELSON GOROM, Sergeant Signal Service Corps, U. S. A.

DATE. June 3-June 10	Portland. Rain.	Temp.	Wind.	Weather.	Red Bluff. Rain.	Temp.	Wind.	Weather.	Sacramento. Rain.	Temp.	Wind.	Weather.	S. Francisco. Rain.	Temp.	Wind.	Weather.	Los Angeles. Rain.	Temp.	Wind.	Weather.	San Diego. Rain.	Temp.	Wind.	Weather.
Thursday	.00	58	N	Cy.	.11	60	S	LR.	.00	65	N	Fr.	.—	58	S W	Cy	.00	70	W	Cl.	.00	66	W	Cl.
Friday	.05	60	W	Fr.	.32	70	N W	Cl.	.01	65	N	Cy.	.—	59	NW	Cl.	.00	76	W	Cl.	.00	66	W	Cy.
Saturday	.03	52	N	Cy.	.00	70	NW	Cl.	.00	69	N	Cl.	.00	62	W	Cl.	.03	78	W	Cl.	.00	70	W	Cl.
Sunday	.00	59	N	Fr.	.00	73	N	Fr.	.00	72	N	Cl.	.00	62	W	Cl.	.00	78	W	Cl.	.00	72	S W	Cl.
Monday	.00	72	S	Cl	.00	80	SE	Cl.	.00	78	S W	Cl.	.00	61	W	Cl.	.00	77	W	Cl.	.00	72	S W	Cl.
Tuesday	.27	59	W	Th.	.—	70	NW	Cy.	.—	70	S W	Cl	.09	61	NW	Fr.	.00	75	W	Cl.	.00	73	S W	Cl.
Wednesday	.07	60	NW	Cy.	.71	62	W	Cy.	.10	70	W	Cy.	.10	59	W	Cl	.00	72	W	Cl.	.00	68	W	Cl.
Totals	.42				1 14				.1t				.19				.00				00			

EXPLANATION.—Cl. for clear; Cy., cloudy; Fr., fair; Fy., foggy; — indicates too small to measure. Temperature wind and weather at 12:00 M. (Pacific Standard time), with amount of rainfall in the preceding 24 hours.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING May 21.		WEEK ENDING May 28.		WEEK ENDING June 4.		WEEK ENDING June 11.	
Alpha	1.10	1.40	1.20	1.35	1.10	1.25	1.10	1.70
Alta	.20	.40	.30	.35	.30	.60	.50	.90
Andes	.45	.60	.55	.65	.45	.50	.55	.60
Argenta	....	.05	....	.15	....	....	....	....
Belcher	1.10	1.30	1.20	1.25	..	1.10	1.10	1.40
Belding	....	....	....	....	....	....	....	....
Best & Belcher	2.30	4.65	4.00	5.00	3.35	3.85	3.70	3.95
Bullion	.35	.40	.40	.45	....	.40	.40	.50
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	....	....	.25	....	.20	....	....
Bodie Con	1.50	1.60	1.40	1.45	1.40	1.55	1.55	2.25
Benton	.10	.15	....	....	....	.10	....	.15
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.30	.50	.40	.45	.40	.45	.45	.50
California	1.55	2.00	....	....	1.60	3.15	2.50	3.45
Challenge	....	.30	....	....	....	.25	.25	.30
Champion	....	....	....	....	....	....	....	....
Chollar	1.60	2.35	2.10	2.50	1.80	2.45	2.26	2.65
Confidence	1.65	1.75	....	....	....	1.75	....	....
Con. Imperial	.15	.20	....	.10	....	.10	....	.10
Con. Virginia	1.55	2.00	2.00	2.30	1.60	3.15	2.50	3.45
Con. Pacific	....	....	....	....	....	....	....	....
Crown Point	1.35	1.65	1.40	1.45	1.35	1.55	1.40	2.30
Day	....	....	....	....	....	....	....	....
Eureka Con	6.25	7.50	7.00	7.12	7.62	7.75	....	7.87
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	.36	.40	.35	.45	....	.30	.35	.40
Grand Prize	....	.75	....	....	....	....	....	.70
Gould & Curry	1.85	2.50	2.10	2.70	2.00	2.35	2.15	2.35
Goodshaw	....	....	....	....	....	....	....	.95
Hale & Norcross	6.87	8.32	6.62	7.37	6.75	7.37	7.12	8.06
Holmes	....	4.30	4.50	4.75	1.75	4.75	4.75	5.00
Indepeudence	....	....	....	....	....	....	....	....
Julia	....	.10	....	....	....	.15	....	....
Justice	....	.16	....	.15	....	.15	.15	.25
Martin White	....	....	....	....	....	....	....	....
Mono	1.20	1.25	1.05	1.25	.90	1.25	1.00	1.40
Mexican	.90	1.30	1.25	1.45	1.05	1.25	1.15	1.80
Mt. Diablo	....	3.85	....	4.00	....	....	....	....
Northern Belle	....	....	....	....	....	....	....	....
Navajo	1.20	1.30	.90	1.25	.90	1.30	.85	.90
North Belle Isle	....	.15	....	.15	....	.10	....	....
Occidental	....	1.40	1.35	1.70	....	1.50	1.50	1.60
Ophir	1.25	1.60	1.60	1.75	1.30	1.75	2.00	2.75
Overman	.20	.25	.35	.60	.20	.50	.40	.65
Potosi	.70	.95	.85	1.00	.70	.85	.85	.95
Pinal Con	....	....	....	....	....	....	....	....
Savage	3.60	4.10	3.85	4.16	3.60	4.20	4.00	4.80
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	1.15	1.60	1.35	1.60	1.20	1.40	1.30	2.60
Silver Hill	....	....	....	....	....	....	....	....
Silver King	....	3.00	....	....	....	3.00	3.00	3.75
Scorpion	.15	.25	.15	.25	.15	.20	....	.20
Syndicate	....	.40	....	.40	.30	.40	.30	.35
Tioga	....	....	....	....	....	....	....	....
Union Con	1.10	1.40	1.25	1.60	1.15	1.40	1.30	1.80
Utah	1.75	2.00	1.80	2.00	....	2.40	3.00	3.00
Yellow Jacket	2.75	3.10	2.65	2.85	2.55	2.75	2.70	2.80
	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY A. M., June 11.

490	Andes	50@60c	
1100	Alta	75@80c	
40	Alpha	1.85	
600	E. & Belcher	3.70@3.75	
200	Bulwer	55c	
422	Bodie Con	2.15@2.20	
400	Benton	15c	
500	Belcher	1.55@1.60	
970	Chollar	2.45@2.50	
360	Con Va & Cal	3.25	
150	Caledonia	35c	
300	Crown Point	1.75@1.80	
20	Eureka Con	8.00	
900	Exchequer	40@45c	
450	Gould & Curry	2.20	
190	Hale & Nor	7.75	
100	Julia	15c	
750	Mexican	1.65@1.75	
20	Mono	1.25	
100	Navajo	95c	
100	N. Belle Is	15c	
700	Ophir	2.20@2.25	
700	Overman	75c	
700	Potosi	1.00@1.05	
1020	Savage	4.55@4.60	
700	Sierra Nevada	1.90@1.95	
100	Silver Hill	10c	
150	Union	1.80	
60	Utah	3.00	
100	Yellow Jacket	3.00	

REDUCTIONS made in the prices of Pebbles. Muller's Optical Depot, 135 Montgomery street, near Bush, opposite Occidental Hotel.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, June 11, 1885.

ANTIMONY—Per pound		@	—
Hallet's	12	@	—
Cookson's	13	@	—
BORAX—Refined	7	@	8½
IRON—Glengarnock ton	26 00	@	—
Eglinton, ton	23 50	@	—
American Soft, ton	27 00	@	—
Oregon Pig, ton		@	—
Clipper Gap, Nos. 1 & 4	25 00	@	30 00
Clay Lane White	26 00	@	—
Shotts, No. 1	26 00	@	—
STEEL—English, lb	16	@	25
Black Diamond, ordinary sizes	13	@	—
Plow	9	@	8
Machinery	10	@	12
Sanderso n Bros	13	@	—
COPPER—			
Braziers' sizes	—	@	25
Fire-box sheets	28	@	—
Bolts	22	@	—
Yellow Metal	14	@	15
Ingot	14	@	15
LEAD—Pig	3½	@	3¾
Bar	5	@	—
Pipe	7	@	—
Sheet	8	@	—
Shot, discount 10% on 500 bag Drop, ¾ bag	1 85	@	—
Buck, ¾ bag	2 05	@	—
Chilled, do	2 25	@	—
TINPLATE—Oldcastle	5 25	@	6 00
Charcoal	5 75	@	6 75
Coke	5 25	@	6 50
Roofing	6 25	@	13 00
ZINC—German	9	@	10
Sheet, 7x3 ft. 7 to 10 lb, loss the cask	9	@	10
QUICKSILVER—By the flask	33 50		
Flasks, new	1 05	@	—
Flasks, old	85	@	—
NEW YORK PRICES—			
California Borax, refined	8	@	8½
Pig Iron, American	17 00	@	18 00
Quicksilver	41½	@	—
Lead	3 70	@	—
Copper	11½	@	—
Tin	14½	@	—
Bar Silver	1 07½	@	—

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List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & CO.'S SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.[

FOR WEEK ENDING JUNE 2, 1885.

319,064.—HEAT REGULATOR — Byce & Dias, Petaluma, Cal.

319,066.—ELEVATOR SUPPORT FOR DERRICK WAGONS—Jas. Carlton, Willows, Cal.

319,067.—RAILWAY SWITCH—Geo. Chalmers, San Juan, Cal.

319,075.—HEADER—C. H. Deane, Hopeton, Cal.

319,077.—MANUFACTURE OF BEET SUGAR— E. F. Dyer, Alvarado, Cal.

319,083.—FOLDING BED—Benj. F. Farrar, S. F.

319,235.—STEAM GENERATOR—W. A. Grondahl, Portland, Or.

319,117.—HEADER STEERER—W. H. Parks, Jr., Marysville, Cal.

319,125.—WORKING ASPHALTUM—Rice, Steiger & Thurber, San Jose, Cal.

319,121.—HARROW—W. F. M. Ricketts, Colton, W. T.

319,132.—LIFTING APPARATUS—C. Sanborn, Sacramento, Cal.

319,136.—GRAINING SKINS—E. Schroeder, S. F.

319,350.—HOSE COUPLING—J. T. Titus, S. F.

319,220.—MAIL BAG—J. C. Franklin, Pendleton, Or.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possibls (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtainod, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SHANK-STIFFENER FOR BOOTS AND SHOES.—Adam Hummer, S. F., assignee of one-half to M. Youngpeter. No. 318,562, datcd May 26, 1885. It consists of a steel plate having its front end made broad and thin, the sides curved and narrowed into a shank or body, which is correspondingly thickened in its central portion, this shank heing again expanded and having a thin circular plate within the heel of the shoe, the form of the whole shank heing such that it conforms to the line of nails and stitches which pass through the leather just outside of the edges of the shank.

TRACE BUCKLE.—Ogden Mallory, Auhurn, Placer county. No: 318,572. Dated May 26, 1885. The invention consists broadly in the combination, in a single buckle, of devices for engaging and holding the trace, and for engaging directly and holding a strap at right angles to the trace, and which forms a continuous saddle and helly strap for one side of the harness or the hillet of either the saddle or helly strap for the other side of the harness. The patent also covers the arrangement and combination of certain plates and links hy which these results are accomplished, and also hy which the buckle may he made to answer, when desirahle, the single purpose of connecting the trace to the hame-tug.

MECHANICAL TRAVERSE-TABLE. — Wm. D. Patterson, Savonas Ferry, British Columhia. No. 318,578. Dated May 26, 1885. This is an implement for simplifying the checking of traverse surveys and facilitating the tsking out of latitudes and departures corresponding to certain distances and vice-versa. This instrument the inventor calls a "mechanical traversetahle" from the nature of its operation and the result it effects. It consists in an arc subtending an angle of 90 degrees and properly graduated or laid off in degrees and fractions thereof; a pivoted swinging arm forming the radius of said arc and properly laid off in chains and fractions; a line forming the side radius of the arm and laid off in chains and fractions showing the latitude, and in a slide moving over the radial arm truly at right-angles with the side radius of the arc, and laid off in chains and fractions showing the longitude. The general construction of these parts and their mechanical arrangement, including the means for setting the radial arm, the means for guiding the slide, the movable or adjustahle reading-glass thereon and the exterior frame of the instrument are also features of the invention.

Bullion Shipments.

Hanauer, June 2, $2,200; Silver Reef (for May), $44.426; Ontario, June 2 $22,989; Christy, June 2, $1,460; Hanauer, June 3, $8,500; Queen of the Hills, June 3, $1,200; Hanauer, June 4, $2,000; Christy, June 4, $1,840; Honerine, June 4, $8,520; Hanauer, June 5, $1,950; Stormont, June 5, $3,850; Hanauer, June 6, $3,850; Crescent, June 6, $3,100; Queen of the Hills, June 6, $1,700; Christy, June 7, $4,859; Kentuck, June 7, $5,000; Hanauer, June 7, $1,900; Stormont, June 7, $1,650; Queen of the Hills, June 7, $1,300.

The banks of Salt Lake City report the receipt for the week ending June 3d, inclusive, of $79,034.78 in bullion, and $13,720 in ore; a total of $92,754.78.

SIGNS are apparent that some of the better prospects in the Columbus Mining District, Nev., will he worked more generonsly this summer than for many years past.

NEW BOOKS ON ASSAYING.

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Table of Contents:

Preface; Introduction; Implements; Assay Balance; Materials; The Assay Office; Preparation of the Ore; Weighing the Charge; Mixing and Charging; Assay Litharge; Systems of the Crucible Assay; Preliminary Assay; Dressing the Crucible Assays; Examples of Dressing; The Melting in Crucibles; Scorification; Cupellation; Weighing the Bead; Parting; Calculating the Assay; Assay of Ore Containing Coarse Metal; Assay of Roasted Ore for Solubility; To Assay a Cupel; Assay by Amalgamation; To Find the Value of a Specimen; Tests for Ores; A Few Special Minerals; Solubility of Metals; Substitutes and Expedients; Assay Tables.

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NOTICE TO ARCHITECTS.

$250 for Plans.

THE DIRECTORS OF THE INSANE ASYLUM OF Arizona propose to erect an asylum of sufficient size and capacity to accommodate 100 patients, near the City of Phœnix, in Maricopa county, Arizona Territory, and for the purpose of obtaining plans and specifications suitable for such an institution, hereby make the following offer to Architects, namely:

FIRST. The Directors will receive plans and specifications offered by Architects, and place on file with their Secretary, N. A. Morford, at Phœnix, Arizona, on or before the 3d day of July, 1885.

SECOND. On said day, or as soon thereafter as practicable, the Directors will examine all the plans and specifications offered, and if any one of them shall be approved by the Directors and adopted for the construction of said asylum, they will pay to the party offering the same, two hundred and fifty dollars; but the Directors reserve the right to reject all plans and specifications offered.

THIRD. The material to be used in the construction of the buildings will be brick, iron, and wood, unless some different material shall be found which is more desirable and which can be supplied for an equal cost.

FOURTH. The cost of the whole construction must not exceed $45,000.

FIFTH. The buildings must be complete in themselves, but so arranged that their capacity may be largely increased with facility by additions without changing or removing the structure.

SIXTH. The prices of material and labor at the site of the building will be approximately as follows, viz.:

Lumber per M., finishing and flooring	$65 00
Lumber per M., rough	45 00
Brick laid in wall, per M	14 00
Rockwork for basement, per perch	3 50
Iron, per lb	4c
Lime, per 1,000 lbs	2 00
Wages. Carpenters, per day	4 00
Bricklayers, per day	5 00
Laborers, per pay	2 00
Painter, per day	4 00
Plasterer, per day	5 00

SEVENTH. The climate is temperate, but the mercury ranges high during about three months of the year, and then it drops to the freezing point in winter, occasionally, and hence provisions must be made against extremely warm as well as cold weather. The temperature ranges approximately as follows:

	Maximum, Means for 1884.	Minimum, Means for 1884.
January	70.1	31.1
February	70.5	34.5
March	76.1	32.9
April	85.2	40.8
May	93.4	49.1
June	103.4	55.7
July	102.0	63.3
August	104.2	63.2
September	89.9	48.3
October	93.0	51.3
November	83.2	40.1
December	67.8	36.1

All plans and specifications sent by mail or express must be prepaid and marked "Plans and Specifications for an Insane Asylum," and addressed to the Secretary of the Directors of the Insane Asylum, Phœnix, Maricopa County, Arizona.

Plans and Specifications will be returned, if required, on receipt of cost of transportation. N. A. MORFORD, Sec'y Board of Insane Asylum Directors.

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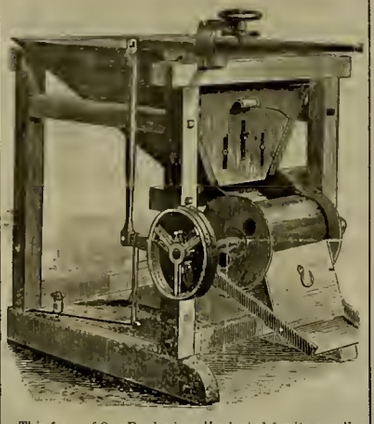
(PATENTED JUNE 24, 1873.)



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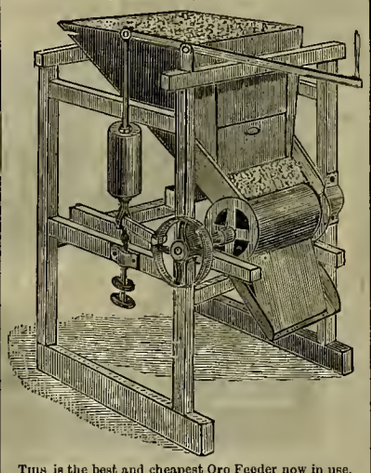
THE ROLLER ORE FEEDER

[Patented May 28, 1882.]



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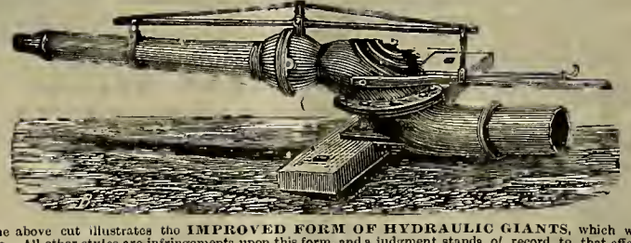
IMPROVED FORM OF HYDRAULIC GIANTS.



The above cut illustrates the IMPROVED FORM OF HYDRAULIC GIANTS, which we manufacture. All other styles are infringements upon this form, and a judgment standa of record to that effect, under the decision of Judge Sawyer of the U. S. Circuit Court in the matter of Hendy and Fisher vs. R. Hoskin et als.

PRICES furnished upon application to

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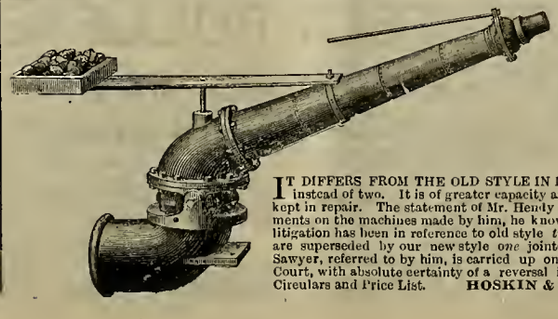

THIS CUT REPRESENTS OUR

IMPROVED

HYDRAULIC

MACHINE.

IT DIFFERS FROM THE OLD STYLE IN HAVING ONLY ONE JOINT instead of two. It is of greater capacity and more easily worked and kept in repair. The statement of Mr. Hendy that *all* styles are infringements on the machines made by him, he knows to be utterly false. All litigation has been in reference to old style *two* jointed machines, which are superseded by our new style *one* jointed. The decision of Judge Sawyer, referred to by him, is carried up on appeal to U. S. Supreme Court, with absolute certainty of a reversal in our favor. Send for Circulars and Price List. HOSKIN & CO., Marysville, Cal.

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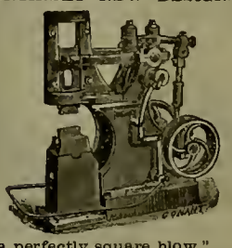
ENTIRELY NEW DESIGN.



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"Gives a perfectly square blow."

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"Repairs are little or nothing, and there are no springs to crystalize."

"Can he run cheaply and with very little power."

"The anvil is entirely separate from the frame."

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"Will give one blow or more as required, light or heavy."

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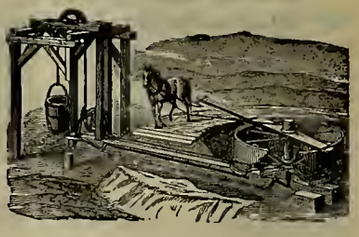

ONE HORSE CAN EASILY HOIST OVER 1,000 LBS. at a depth of 500 feet. The Whim is mainly built of wrought iron. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending the bucket. The standard of the whim is bolted to bed-timbers, thus avoiding all framework. When required, these whims are made in sections to pack on mules.

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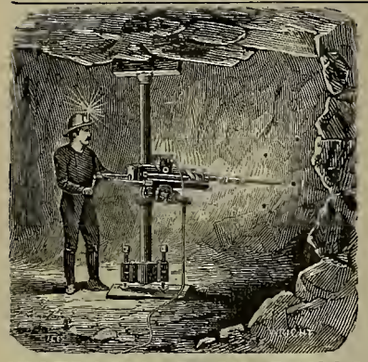

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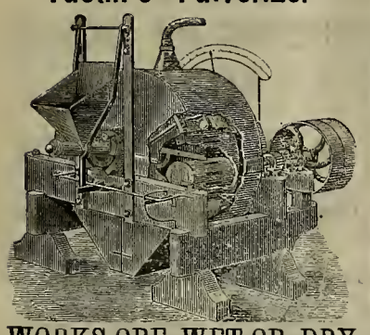

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This Coke is exclusively used by the Selby Smelting and Lead Co., Union Iron Works, Professor Thomas Price, and other consumers here. Large quantities are regularly forwarded to Copper Smelters in Arizona and New Mexico, and also to consumers in Nevada and Salt Lake.

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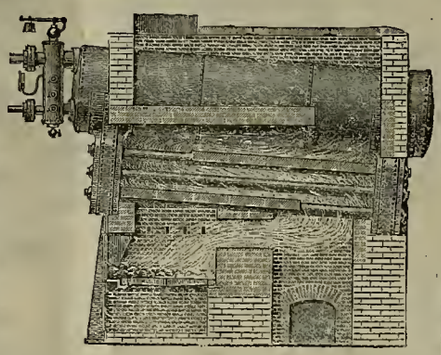

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Risdon Iron and Locomotive Works—Gentlemen: We have had one of your Heine Patent Safety Boilers in use for four months at our Borax Works, in Alameda. It does good work and gives perfect satisfaction. Yours truly,
(Signed) WM. T. COLEMAN & CO.

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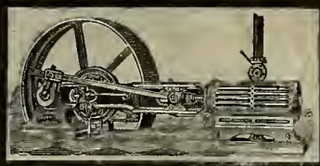
SEND FOR 150 PAGE ILLS CATALOGUE.



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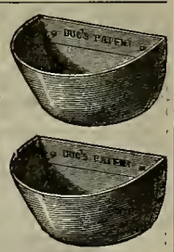

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Made of Best Charcoal Iron. Only One Seam. No Corners to Catch. Runs with Least Power.

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Manufactured of BEST STEAM METAL. We claim ths following advaotages over other Valves and Gauge Cocks now in use:

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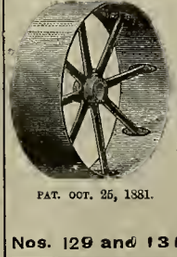

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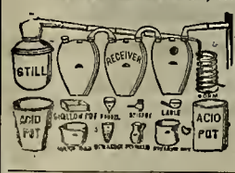

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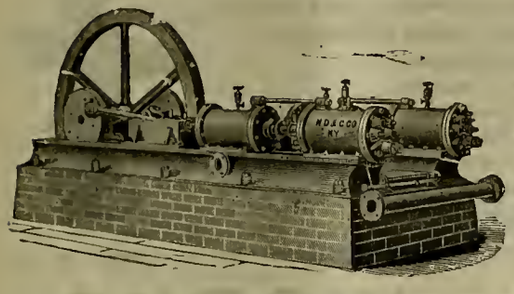

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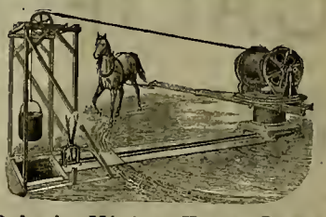

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Possessing all the requirements of a first-class hoist, and affording means for the continuous operation of a Pump or Blower, without interfering with a hoisting apparatus. It is made entirely of iron, no piece weighs over 300 pounds. At the ordinary speed of a horse, a 1,000-pound bucket of ore may be raised 120 feet per minute. The hoisting-drum is under the complete control of the man of the shaft, and is capable of carrying 500 feet of five-eighths steel rope. SEND FOR CIRCULAR.

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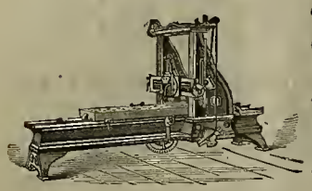

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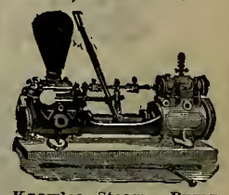

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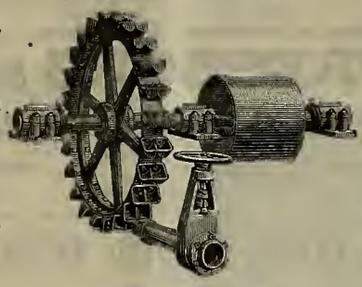

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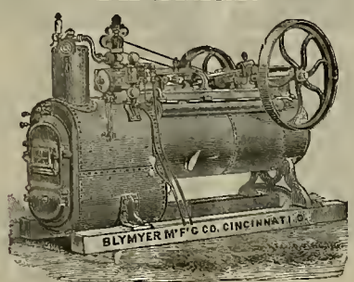

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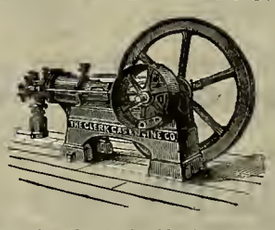

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JUNE 20, 1885.

VOLUME XLXX
Number 25.

Working in Hot Mines.

When men first begin to work in very hot mines they lose their strength almost invariably and the slightest exertion is burdensome. They feel no desire to eat and the stomach commonly rejects what food is taken. Ordinarily, also, the decrease in their weight is very considerable. This condition of body does not last more than three or four days usually. Then the men regain their vigor and flesh rapidly, their appetite returns and their health does not visibly suffer. In many instances the effect of heat is clearly beneficial. By the exercise of care in avoiding sudden chills rheumatic affections are eradicated; all impurities of the blood are rapidly purged from the system, boils, pimples and other eruptions soon disappear, the flesh becomes plump and firm, the glands secrete oil rapidly, the skin grows smooth and slippery to the touch and the complexion is clear if somewhat sallow. This is the record of the U. T. census agents, who investigated this subject in 1880 on the Comstock, where there is an abundant field for examination and comparison.

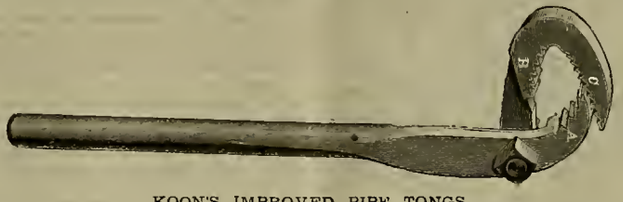
The ultimate effect of this extreme heat on the miner's constitution is not so easily noted. The mine levels on the Comstock differ so materially in temperature and the assigned station of a miner is so frequently changed that it is impossible to obtain complete and comparative data. That prolonged labor in a hot, impure atmosphere will assuredly shorten life appears indisputable, but whether the system is permanently or materially injured by intermittent work under these conditions is more questionable. The power of recuperation appears extraordinary, and unless the strain is intense and frequent no lasting injury may be inflicted. The limits of permissible strains will, of course, vary with the relative power of endurance.

In the recent monograph of the U. S. Geological Survey, by Eliot Lord, on "Comstock Mining and Miners" it is stated on the authority of the testimony procured by the census agents that the action of all the bodily organs of the Comstock miners appears to be stimulated by the heat with the exception of the stomach alone. The food of the ordinary laborer is unpalatable to the miner in the hot levels, and coarse ill-cooked provisions would not be accepted or digested readily. The men crave fruits and highly seasoned dishes, pickles, pigs' feet, hams, almost every food with a pure acid or salt flavor. They demand and obtain the best supplies possible to gratify the natural craving and squeamishness of taste. The delicate condition of their digestive powers is as undoubtedly due to the quantity of ice water which they drink, as to the heat which they undergo. Yet they must have cool drinks at frequent intervals, and feverish men cannot be expected to gauge carefully the quantity or the coldness of the water which they need. If the temperature of the water-tanks was regulated by the mine superintendents their employes would be less subject to dyspepsia.

TUOLUMNE county has 2,006 school children.

Koons' Pipe Tongs.

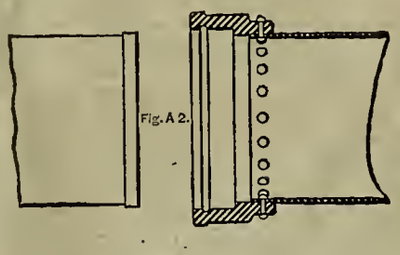
George B. Koons, of Half Moon Bay, has patented through the MINING AND SCIENTIFIC PRESS Patent Agency an improved form of pipe tongs, which is shown in the accompanying engraving. The lever bar has the outer end slightly curved beyond the fulcrum pin, which passes through it, and a hook-shaped jaw hinged to the fulcrum pin so that its end will pass by and overlap the curved end or jaw of the lever to which it is hinged, the interior of both the shaft and the movable jaw being corrugated so as to hold the pipe.



KOON'S IMPROVED PIPE TONGS.

The handle or lever, made of suitable length, has its upper end curved to one side, as shown at *A*. The hook-shaped jaw *B C* is pivoted to the flattened portion of the handle, *A*, by a bolt. The portion *A* forming the jaw upon the main lever is made of such thickness that it extends outward so as to stand opposite the jaw *B* upon the side where it is bolted to the lever, and the opposite hinged jaw in a like manner extends over the side of the flattened portion of the main arm so as to give considerable thickness and bring the two jaws opposite to each other.

The jaw *B C* is made of such a length and bent to such an angle that its outer end will just pass the point of the jaw *A*, where the two are closed together, and by this construction the two jaws will take in pipes having a considerable difference in size. The interior of both jaws is corrugated so as to take hold of the pipe, and it will be seen from the peculiar shape of the jaw *B C*, and the curve of the jaw *A* that the pressure will be applied to three sides of the pipe or bolt on which the device is to act. This enables the inventor to apply a very strong power without crushing the pipe.



Bell End Joint.

Fig. 2.—Moore & Smith's Pipe Joint.

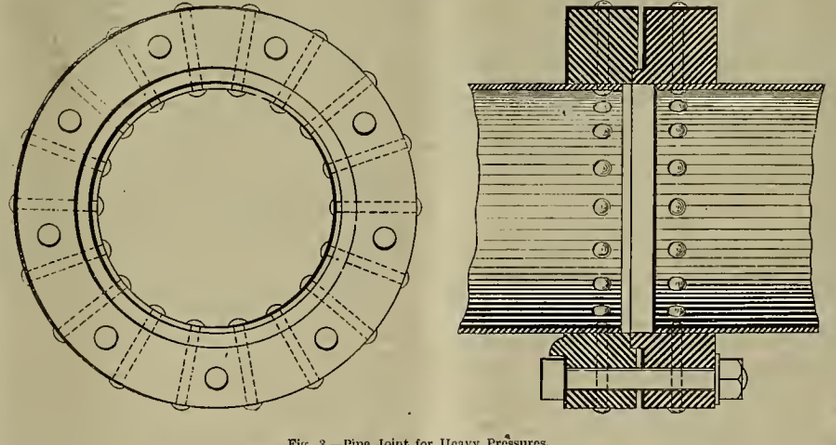


Fig. 3.—Pipe Joint for Heavy Pressures.

PIPE JOINTS FOR HYDRAULIC PIPE AND PUMP COLUMNS.

WOOD RIVER has four towns within a radius of 12 miles, namely: Bellevue, Hailey, Ketchum and Bullion. Bellevue has 1,000 inhabitants, Hailey 1,200, Ketchum 1,000, and Bullion 400. It is quite dull at these camps at present; mines full handed.

Quite a lively mining camp has sprung up at Deadwood near the boundary line of Shasta and Trinity counties.

MR. HENRY G. HANKS, State Mineralogist, has returned to San Francisco from New Orleans.

Pipe Joints.

The wrought-iron riveted pipe made in large quantities in this city for mining purposes is mostly made with inside and outside parallel courses, with an inside sleeve riveted on one end. This sleeve projects into the adjoining section of pipe where the pipes are laid together. A band of iron is put over this joint, having an annular space between it and the pipe, which is filled with lead and caulked. This is Moore & Smith's joint, which is illustrated in Fig. 2 on this page. It was patented by Joseph Moore, superintendent of the Risdon Iron Works, and Francis Smith. The meeting ends of the pipes are connected firmly together and the band or tube is placed around the outside of the meeting ends, which is larger in diameter than the pipes, and which is large enough to extend a distance on each side of the joint. The space between the outside band is then packed with lead, either by casting or tamping.

This is found to be the best sort of joint for thick pipes that are too small for riveting together, and even where the pipes can be riveted together an occasional joint of this kind is good, because it allows for expansion and contraction, and by its use pipes may be run out of a straight line without the use of elbows. For pipes made of No. 18 and 16 iron the joints can be made by slipping one into the other. Such joints are termed "slip joints." The pipe joint for heavy pressures, such as are used for hydraulic pump columns in mines, is shown in Fig. 3. The Risdon Iron Works of this city have made several thousand joints of this style, in the construction of pipe of wrought-iron and cast-iron for hydraulic machinery. For water pipe for hydraulic mining and water works the Risdon has built over 150 miles—some of it of the largest size—up to 52 inches in diameter. The pipe for the Spring Valley Water Works recently made, requires 16,000 tons of plate iron and rivets in its manufacture.

AMADOR MINES.—We were shown this week some very rich nuggets from the Gover mine, Amador county. They were black, antimonial sulphurets covered with gold. About six pounds of this black stuff taken out of a little pocket paid $124 per pound. It is similar to the material which comes from the well-known Nevill mine, on the Mokelumne river. The Gover mine has been shut down the past few years, but has been started up again, pumped out and 20 stamps are running on its ore now. They have a good ledge and good prospects. On the 500 level there are 15 or 20 feeders, and above they are working 12 feet of a ledge. Our informant thinks that during the next few years many more mines will be worked in Amador county than at present.

THE CHEAPEST MACHINERY to buy is the *best*. It will wear longer, require less repairs, and give better satisfaction than though cheaper in price because inferior in workmanship.

GOLD dust has been found near Pioche, Nev., in the sediment, from washed wool fleeces. Everybody is seeking for the spot where the sheep had been rolling.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Gravel Deposits of the Lower Klamath.

EDITORS PRESS:—There is a vast and diversified system of gravel deposits in Humboldt and Del Norte counties, on and contiguous to the coast, which is unlike the placers of any other portion of the State, and are worthy a careful study by both the gold miner and the geologist. The Klamath river, as it at present runs, has a course for the most part at variance with the general course of large streams on this coast, and there are evidences that this identical river, as also the Trinity river, and not a former system of rivers, found their way to the ocean by a different course than that through which their waters now flow. In order to comprehend fully the extent and richness of the gravel and quartz debris that have been deposited on their way to the sea level, it will be necessary to first refer to the fact that there is lying southeasterly and northwesterly, from 40 to 80 miles from the beach, a strip of country threaded with free gold quartz, a heavy ledge of which was tapped in the celebrated Black Bear mine, on the Salmon river. The tributaries of the Klamath, nearly all, cut their way through this quartz section, which shows itself rich at intervals until it crosses the Trinity river, and in its southeasterly course crosses the coast divide and spends its wealth on the headwaters of tributaries to the Sacramento river. The Trinity river and tributaries, in particular, are the recipients in a rich degree of this gold-bearing debris, and there is scarcely a tributary of either the Klamath or Trinity but what has gold-bearing gravel and has been mined with greater or less degree of success since the first gold mining excitement. Thus it will be seen at a glance that these two rivers, the Klamath and Trinity, both during their former and present channels, have necessarily become the highway for the decomposed quartz debris that has been loosened from the gold-bearing ledges of a territory hundreds of miles in extent and known to be exceptionally rich in auriferous deposits. A great portion of this territory, and which contains gravel beds which in extent are well-nigh inexhaustible, has only known the rush and haste of the earlier mining methods, and when they ceased to pay with rocker or pick and shovel sluice have been abandoned.

A few large gravel banks indeed were located and organized; capital attempted their development on a large scale with advanced mining appliances and methods, but the operations were placed in charge of kid glove superintendents, whose inevitable failure brought disrepute, which combined with other causes, turned the attention of mining men and capital to other sections. The facts remain, however, of extensive and rich placers; of magnificent water privileges; of abundance of fine timber; of uniform climate and a country that will produce an abundance of food; last and most important of all, the Klamath is free from the debris trouble, for it finds its channel through a canyon and debouches suddenly upon the ocean from between high mountains. There can be no fear of injunction from valley farmers and the water is ample to carry on the largest character of placer mining.

These remarks apply to and are descriptive of that section of the Klamath river from the intersection of the Trinity to the ocean. The river is a fine navigable stream, and one cause for the tardy development of its mineral wealth lies in the fact that while the river is the natural avenue through which development and progress must come, it has been locked up by a sham Indian reservation. This reservation will be thrown open next spring, when it is most likely the placers of which I have spoken will receive the attention they deserve.

As an *on dit* I may mention the fact that Mr. A. Jacobs, of Plumas, and Dr. J. W. Starr, of Oregon, have recently located what I conceive to be a most valuable gravel claim and water privilege, and design to bring in a ditch this summer sufficient to fill two giants. The gentlemen are both experienced placer miners and have during the last two months made a very thorough prospect of their claim, which they say is rich as they want it for hydraulic mining.

WM. AYERS.

ARASTRAS.—Some of our gold ledge owners are thinking of putting up the old fashioned arastra on their claims, in order to work and develop the same, and when time and labor proves satisfactorily that they have something of value to work on, they will then see about putting up a mill. This is the right way to prospect and open out your property. If it proves good, then it will be soon enough to determine the nature and quality of works you require. If every claim owner would only go to work and stick to it until good or bad results were obtained, instead of going around with samples and blowing about them in hopes of trapping a purchaser, this Territory would improve rapidly and prosperity replace poverty. —*Prescott Courier.*

About $500,000 in gold dust and gold bars were shipped from Shasta county in 1884.

Progress of Metallurgy.

Smelting Copper, Silver, Lead and Zinc.

In an article on the "Inventories Exhibition" in the London *Mining Journal*, after referring to the progress in iron and steel making, the writer says:

In the smelting of copper ores the most striking feature is the development of the method originally proposed by Henderson of extracting small quantities of copper from burnt pyrites by calcination with salt and lixiviating with water, which leaves the iron of the pyrites, formerly wasted as slag, in a form that can be economized by the iron smelter. This has been improved by Claudet's process of separating as iodide the silver which is almost entirely contained in the first part of the copper liquors and was formerly lost. Another and less convenient method of separating such silver as sulphide has been proposed by Gibb. In the older smelting processes gravitating calcining furnaces, such as those of Gerstenhofer, Hasenclever, and Helbig, have been introduced to do away with hand labor in roasting pyritic ores; these are mostly combined with methods for utilizing the sulphur gases in sulphuric acid making. In fusion processes tall blast furnaces and cupolas have to some extent superseded the Welsh reverberatory form. In America, especially, cupolas with water-jacketed hearths are in great favor. Attempts have been made to simplify the Welsh process of smelting by substituting the Bessemer converter for the more gradual methods of concentration in the reverberatory furnace. This, as originally tried with pyritic ores by Hollway, failed, but has since achieved some success as a substitute for the roaster process in producing blister copper from regulus by Manhes, of Lyons. In the refining of copper the principal improvement has been the adoption of Percy's method of producing sound castings by the use of phosphorous in small quantities, which has also been extended to the alloys known as phosphor bronzes. Valuable copper alloy has been formed by the addition of small quantities of other metals, such as manganese, in Parson's manganese bronze, now generally used for large screw propeller and iron in the so-called sterro metal and delta metal. A small proportion of silicon is also used for imparting strength to copper in the alloy called silicon bronze, which possesses great strength, while its electric conductivity is but little less than that of pure copper. A new departure in copper refining has been made, consequent upon the introduction of dynamo-electric machines—the refining of blister copper or rich foreign regulus electrolytically, the metal being obtained in a very pure state, while foreign matter, including gold and silver, remain behind in a form convenient for further treatment. This has as yet been only adopted in a small number of instances.

In Lead Smelting

The processes based upon the operations of complete desulphurization and fritting or actual fusion to slag in the roasting furnace, followed by reduction in large blast furnaces, mainly with water casings, are now very general, and in America the automatic or siphon tap, which allows the operation of casting the reduced lead into pigs to go on continuously, is frequently added to such furnaces. Parke's method of desilverizing lead by means of zinc, which had remained in abeyance for many years, has now come very generally into use, having almost entirely superseded Pattenson's process of crystallization. This is in some way due to the improvements made in the accessory operations of refining the desilverized lead and the recovery of the silver from the zinc crusts, upon which much ingenuity has been expended. Among the former contrivances may be mentioned Cordurie's method of removing zinc by steam at a red heat, and that of dissolving the zinc oxide by carbonate of ammonia. For the distillation of the argentiferous zinc Faber du Faur's bottle-shaped retort and portable furnace is most used. The most important modification of Pattenson's process is that of Luce and Rozanne, who effect the crystallization by blowing steam through the melted lead and tap off the enriched liquid lead from the crystals, an arrangement that enables steam-power to be substituted for hand labor. The separation of lead from silver has also been effected electrolytically by Keith, in America, but as yet only on a small scale.

In the Production of Zinc

Numerous improvements in detail have been made in the old processes, with a view of economizing fuel and more perfectly condensing the reduced metal. The growing scarcity of calamies or oxidized ore has led to the substitution of blende, which necessitates very careful calcination, as well as methods of absorbing the sulphurous gases, such as ordinary acid chambers and towers containing lime water, sulphide of calcium or dolomite. In the reduction of the oxide, gas furnaces such as those of Siemens and Boetius are in favor, and the number of retorts or muffles per furnace is largely increased, as many as 64 muffles and 40S retorts being now heated from a single fireplace. The condensation of the zinc vapor has been improved by increasing the size of the receivers, and filtering the exhaust gases of the retorts through cotton wool, the substitution of aspirators drawing the gases through water for the natural draught, and similar contrivances. The production of zinc as a continuous operation without the use of retorts has been tried by numerous inventors, but as yet without success. The utilization of the intimate mixtures of lead, zinc and copper ores known as bluestone, which cannot be separated mechanically, has been effected on a working scale by a combination of furnace and liquid extraction processes by Maxwell, Lyte and Parnell. Among the less abundant metals nickel has come into increased use, as means have been found of depositing it by electrolysis upon brass and other metal work as a hard and very brilliant covering. Sound castings from pure nickel have also been obtained by Fleitmann, by the addition of a small quantity of magnesium to the melted metal.

The Metallurgy of Silver

Presents little that is new in principle, although many of the older processes have received important modifications in detail. The European process of barrel amalgamation is now almost abandoned, the American pan process being perhaps most generally used, although the primitive method of amalgamation in open heaps, with the assistance of only solar heat is still predominant in Mexico and other Spanish-American countries. On the southwest coast of America Krohnke's process of amalgamation in barrels with subchloride of copper and zinc, amalgam has been largely used. Where it is necessary to subject ores to a chloridizing, roasting, mechanical, or gravitating furnace, such as Bruckner's rotator and Stetefeld's tower furnace are preferred. Percy and Von Patera's method of extracting silver by alkaline hyposulphites has been introduced in America, though not to the same extent as amalgamation. A new modification has recently been proposed by Russel, in which the silver solvent is a double hydrosulphite of copper and sodium.

In the metallurgy of gold the chief novelties are the general introduction of cast-iron vessels and sulphuric acid as a parting agent in separating gold from silver, and a process founded on the old method of parting by sulphur combined with oxidation by air and the adoption of means of saving the sulphur gases by Rossler. Auriferous copper is also economically treated by subjecting the granulated metal to the slow action of sulphuric acid and moist air, whereby no acid is wasted. The separation of silver in small quantities from gold has been effected by Miller by blowing gaseous chlorine through the melted alloy, and the same process is also used for toughening gold intended for coinage. The refining and manufacture of the heavy metals of the platinum group, and more particularly platinum and nidium, have received a great impetus from the introduction of Deville's method of fusion in lime furnaces; but the further consideration of the subject belongs rather to general chemistry.

The utilization of slags from different kinds of smelting processes has not as yet made much progress. The highly phosphuretted slags of the Thomas and Gilchrist process are subjected to chemical treatment to recover the phosphoric acid for use as a manure, while those of the blast furnace when granulated are used in making Portland cement concrete, and to some extent as an improver of the cement. Another product known as "slag wool" or "silicate cotton," made by blowing air through liquid slag, is used as a non-conducting covering for steam pipes. In America the practice of allowing the liquid slag to run to waste over the ground instead of moulding it into blocks is now very common, and is followed even when it is necessary to remove it for some distance from the furnaces before pouring it out. This is done by using large tanks lined with fire brick, which are drawn away by locomotives when filled.

THE PROSPECTOR.—A correspondent of the Pioche *Record* says: It is, I believe, the general supposition that the life of a prospector is a lazy and a lonely one, spiced occasionally with some harmless delusion, such as building castles in the air, during which he imagines himself a millionaire, with thousands at his command, wherewith to build mills, roads, etc. As to the vocation being a lazy one, I differ with the general public, that is, the larger class of citizens who are willing enough to concede to the prospector the merit of being the pioneer of civilization in the far West, but who still retain a lurking suspicion that he is somewhat a lazy, devil-may-care kind of fellow, that is satisfied with a hermitage in the mountains as long as he has enough bread, bacon and coffee to satisfy the inner man. Now, nothing is farther from the truth than this, for the man who devotes the best years of his life in searching for the precious metals is too ambitious to be lazy; besides, his mistress, the golden-visioned goddess of the Sierras, rules him with a hard hand, if it is a golden one. As to prospecting being a lonely business, it is quite the reverse, for the fortune seeker learns to love the aroma of the pine and cedar, and while he views the large expanse of country from some lofty peak near his mountain home, he feels as free from the burdensome conventionalities of this Nineteenth Century as old Father Adam was when he first saw the light of day in the Garden of Eden. Besides, there are reminiscences to be related by the camp-fire, for there are few prospectors but who have led eventful lives in their search after the precious metals in Arizona and the other outlying Territories, where the scalp and knife of the Indian hung over their trail like the sword of Damocles over the Philistines.

The old Merrimac mill on the Carson river, one of the oldest style quartz mills in Nevada, will soon be dismantled or modernized.

The Mechanics' Fair.

Preliminary Announcement of the Twentieth Exhibition.

A preliminary announcement concerning the Twentieth Industrial Exhibition of the Mechanics' Institute at the Pavilion is made by the Board of Trustees for 1885, as follows:

The Mechanics' Institute of the city of San Francisco, organized in 1855 for the dissemination of information and useful knowledge, which has held under its auspices nineteen industrial fairs, again takes pleasure in announcing that the twentieth exhibition of art, manufactures, science and natural products, will be opened on Tuesday, August 25th, at their immense Pavilion, located on Larkin, Grove, Polk and Hayes streets, which will be still further enlarged and improved for this occasion, and supplied with every requirement for the proper display of articles and machinery, including a plentiful supply of steam, water, gas and power, the latter from a large and powerful engine to be manufactured expressly for this exhibition.

It is conceded that a comprehensive exhibition of natural or manufactured products, when given by a Government, State, county or society, is productive of good to the general community by bringing together at one time the producer and consumer, the manufacturer and dealer, or those engaged in like occupations, whereby an exchange of ideas may be had and comparison of results arrived at, which have been carried out in various ways for the same end, but under different rules and conditions.

The benefit of these gatherings of people and products has been recognized by all great nations, particularly our own Government, for twice our Representatives at Washington have made an appropriation for such purposes, namely, at Philadelphia and New Orleans. Material aid has also been given by nearly all the States in the Union to encourage and foster local fairs within their borders, showing that our wisest legislators believe in such exhibitions, and recognize their benefit to the commonwealth.

It is the desire of the management to have the display of manufactured and natural products as full and perfect as possible, that the varied resources of this coast may be brought together in such forms as may best afford the citizen seeking information, the capitalist seeking investment, the visitor from the Eastern States or immigrant from Europe seeking a business opening or a home, an opportunity to inform themselves of the skill and advancement of our citizens and inventors, and the variety, excellence and superiority of our products, which in the near future must and will be an important factor in the world's consumption.

To that end the managers hope to have a general display of manufacturing machinery in operation, raw and manufactured products, and all articles used in the arts and sciences, and necessary for the wants of man.

Firms and individuals who wish to have their articles brought into extensive notice for general good or individual benefit, can find no better place or opportunity than this occasion offers.

Liberal and comprehensive premiums will be awarded to exhibitors, consisting of gold, silver and bronze medals, diplomas and cash.

At the close of the fair a full and complete report will be published for general distribution, with notice of each exhibitor and article exhibited.

A copy of the rules and regulations, premium list, or any desired information will be promptly given or sent, on application to the Assistant Secretary.

The Trustees for 1885 are as follows: P. B. Cornwall, president; David Kerr, vice-president; J. A. Bauer, treasurer; W. P. Stout, secretary; J. H. Culver, assistant secretary; J. H. Gilmore, superintendent; C. Watherhouse, D. J. MacDonald, C. F. Bassett, Geo. H. Hopps, S. J. Hendy, James Spiers, George Spaulding, J. R. Wilcox, Byron Jackson, John Mallon.

The office of the exhibition is at 31 Post street, San Francisco, Cal.

A NEW CONCENTRATOR.—The Denver *Times* says that Gov. Tabor has organized a company to manufacture and introduce a new concentrator which, if it shall do what is claimed for it, will cause a revolution in mining in Colorado and the West. After the crushing of the ore it is concentrated by means of pans, arranged to work much like prospectors' gold-pans. Each machine has about a hundred pans on it, or has a capacity of seventy-five tons a day. From 75 to 85 per cent of mineral is claimed to be saved, and the cost of treating the ore is only forty cents a ton. The cost of each machine is about $2,500.

FIVE STAMP MILL.—E. A. Reid went below yesterday morning to purchase the five-stamp mill and concentrator they are preparing to erect on their mine at the head of Star Gulch. Ed. will visit the foundry at Marysville, also those in San Francisco, and will purchase where he can get the best bargain. The foundation, houses, etc., are now prepared for the mill, and inside of two months the music of a five-stamp mill will be heard in the Buckeye district.—*Shasta County Democrat.*

All of the new hoisting and pumping machinery at the Nevada county (Fleming) mine in Deer creek, at its junction with Gold Run, has been started.

MECHANICAL PROGRESS.

The Patience of Metals.

We take the following paragraph from Dr. Percy's address delivered before the Iron and Steel Institute May 6th: We hear in these days of the "fatigue," "refreshment," and "patience" of metals, terms which, when applied to inanimate objects, may bewilder the uninitiated, and at first, perhaps, puzzle the initiated. When a metal is subject to mechanical treatment which produces what is called stress or strain, its component particles may become so disturbed and disarranged, within the limits of elasticity be it understood, that, after its withdrawal from such treatment, and left at rest, some time, and in certain cases considerable time, must elapse before the particles will have spontaneously readjusted themselves as they originally were. The word fatigue, I apprehend, is meant to indicate such disturbance; the word refreshment, restoration of the metal to its original state; and the word patience, the time required for that restoration.

So lately as February last a paper was read to the American Institute of Mining Engineers by Mr. Henry M. Howe, Boston, on the patience of copper and silver as affected by annealing, on which he has experimented. His results possess considerable interest. He refers to the experiments of Prof. R. H. Thurston on the resistance of iron to prolonged stress, which show that an unannealed iron greatly exceeds in tensile strength the same iron when annealed, a fact long previously known, so it likewise greatly exceeds the latter in patience. I must refer you to the original papers for information as to numerical and other details, because time forbids that I should do more than notice the subject on the present occasion. The power, Mr. Howe remarks, of resisting prolonged stress bears no fixed relation to what is commonly called tensile strength, or the power of resisting tensile stress for a very short time. He suggests that the word endurance might be more appropiate than patience for expressing the former kind of power.

A paper on the influence of stress and strain on the physical properties of matter has recently (December, 1884) been communicated to the Royal Society by Mr. Herbert Tomlinson, in which is contained matter of interest and of practical importance in references to the application of iron wire. He finds the loss of energy of a torsionally vibrating iron wire to be permanently diminished to a very large extent hy repeated heating to 100° C., and cooling combined with long rest, and to be very considerably diminished temporarily by rise of temperatures.

There is a widespread impression, not to say belief, that a razor when left at rest some time after use becomes sharper spontaneously. The number of persons having the opportunity of personally experimenting on this important question has greatly decreased in recent years, yet some remain who still practice the tonsorial art and it must be left to them to determine whether that impression be erroneous or not. Should it prove to be correct, then the razor might probably be adduced as affording an illustration of fatigue, refreshment and patience. Is it not strange that on such a simple practical question as this opinion should still be divided?

MELTING STEEL SCRAP IN A CUPOLA.—The Columbus (Geo.) *Enquirer* publishes the following: Columbus has done what no other foundry in the United States has ever done—*i. e.*, accomplished the feat of melting steel scrap in an ordinary cupola. This has been done by Mr. Kohers E. Masters, foreman of the Columbus Iron Foundry. The iron works had tons of steel scrap on hand which they considered dead stock, and Mr. Masters summoned his ingenuity to make it profitable and useful. The steel was of a class of steel known as plow or agricultural steel, and he succeeded in melting some 70,000 pounds of it, and making it into old plow points with complete success. Lately the iron works made another step forward in foundry practice—that of melting and successfully molding rail steel. The iron works were solicited by the general superintendent of the Baltimore & Ohio Railroad to instruct them in the method of steel melting. As there are thousands of tons of steel rails in the country of no value, Mr. Masters got the president of the iron works to let him undertake to melt the rail. He cut the rail into pieces a foot long, and made a trial heat of a 1,000 pounds. He succeeded in producing some very fine castings, at a rate of five pounds of steel to one pound of fuel, consumed at a temperature of about 3,000 degrees.

IMPROVING THE BESSEMER PROCESS.—Mr. Loudsr, of Pittsburg, Pa., has patented what he claims to be an important improvement on the Bessemer process, in which the charge of metal at the end of the blowing operation contains the desired amount of carbon, as distinguished from the ordinary method, whereby the entire charge of pig metal is first completely decarhurized, and the carbon is added after the blow is finished. The inventor first charges the converter with a portion only of the entire charge, and after treating it in the usual way until it is thoroughly decarhurized the remainder of the charge is added. The air blast is turned on until the silicon is removed, and the blow is stopped at the point where the further decarburization would commence, after which the requisite amount of manganese is added. One of the advantages claimed for this process is that, as no decarburizing addition is inserted into the charge after the final blow, the whole process may be conducted with a single kind and quality of pig iron.

A New Process for Hardening Plaster of Paris.

A new process for rendering plaster very hard and capable of being substituted for wood in flooring has been brought out by M. Juhls. Plaster has this advantage over cements, and even over wood, that it increases rather than diminishes in bulk on being applied to structures, but it fails in hardness and surface resistance. To overcome this difficulty M. Juhls mixes six parts of good plaster with one part of rich lime recently slaked and finely sifted. This mixture is to be used like ordinary plaster, and the object made from it when it is very dry is caused to imbibe a solution of a sulphate, which has a base precipitable by lime, and this precipitate is insoluble. Such are the sulphates of zinc or iron. The theory of the process is as follows:

The lime contained in the pores of the plaster decomposes the sulphate, with production of two insoluble bodies, to wit, sulphate of lime and oxide, which fill the pores of the object submitted to the treatment in question. With sulphate of zinc the object keeps of a white color, but with sulphate of iron the object, at first greenish, takes on drying and with lapse of time the color of the sesquioxide of iron. With sulphate of iron the hardest surfaces are obtained, the resistence of rupture being 20 times greater than with ordinary plaster. To obtain the maximum hardness and tenacity it is necessary that the object should first be very dry and steeped in a solution which is practically saturated. The first immersion of the object in the solution ought not to last over two hours, as a too-long immersion at first is apt to render the surface friable. On drying the plaster object afresh after the first immersion there is no further fear of its becoming friable. If the proportion of slaked lime is too great the surface is apt to take a very hard marble-like skin, which prevents the hardening of the inner portions of the object. The proportion of one of lime to six of plaster, as stated above, has given the best results.

Plaques made in this way can be browned by rubbing them with linseed oil and litharge, and glazed on the surface with hard copal varnish. A beautiful glassy flooring like polished oak can in this way be prepared.

A METAL DRILLING TOOL of new form has been patented by T. Sheffler, of Patterson, N. J. The cylindrical head of the tool which carries the drill is surrounded by two half-rings which rest in a groove cast around the head. A cam enters between two of the adjacent edges of the half-rings. A handle made with an eye at one end surrounds the head. This handle is provided with an irregular socket which receives the cam. On moving the handle to the right the cam forces the half-rings apart, so that the latter friction tightly up against the head and forces it around. On the reverse motion of the handle no strain is placed on the rings, and they simply revolve loosely with the handle.

TAPERING HOLES.—Some of the best bolt fitting is being done with tapering holes instead of straight holes. The holes are drilled straight, but are reamed with a reamer that is slightly tapering. The bolts are turned by fixed gauge to fit. The taper is really more than one one-hundredth of an inch—or on three inches, three one-hundredths of an inch—but is just sufficient to make a perfect fit when the bolt is home, and is enough to allow a slight tap of a hammer to start it back. Better fits can he made in this way than hy straight holes, and work can be put together and taken apart much more rapidly.

THE SAFETY OF CAST-IRON COLUMNS.—The Berlin police authorities, in consequence of unfavorable experiences with cast-iron columns in recent fires in Berlin, have lately issued regulations forbidding the use of such supports in the construction of dwelling-houses, but permitting the employment of columns of wrought-iron and Dutch brick in cement mortar. Cast-iron columns may only be employed if they are surrounded with immovable mantles of wrought-iron separated from them by an air space.

IMPROVED COTTON PRESS.—A Laurens county, S. C., man has invented an automatic cotton press which feeds from the throat of the gin, puts on and fastens the bagging and ties, and ejects the hale without the cotton being handled after passing into the gin. Immediately after the bale has been thrown out it readjusts itself, and without a minute of lost time goes on packing the next hale. The machinery is exceedingly simple and easily adjusted.

WOODEN HOOPS BY MACHINERY.—Machinery for making wooden hoops has been started at Williamsport, Pa., which are said to he far superior to those made hy hand, and orders received from New York already exceed the ability to supply. Machines will he set up at once in different localities through the State.

SCIENTIFIC PROGRESS.

The Durability of Dynamos.

The subject of the durability of a dynamo for electric lighting purposes has become a matter of quite important discussion, for the reason that on the life of those instruments depends to a considerable extent the "maintenance" or ultimate cost of electric lights. Their durability has been variously given at from two years upwards. A recent careful examination of several dynamos, which have been in constant use for from two to three years, under careful management, according to the *Mechanical World*, shows no material wear; while others, less carefully managed, show more or less wear of the commutator and collecting brushes. It is only in that portion of the machine that any considerable wear is likely to occur, and those parts should be removable, and replaced after material wear. The bearings should last many years—as long as a rapidly running steam engine.

In a properly constructed and well-managed dynamo there should he very little "sparking." Every spark means a loss of metal and, of course, wear. One dynamo brought to the attention of the journal mentioned, in one year's time had used five sets of brushes, which, of course, meant great wear. Another dynamo had been in the same kind and amount of use for upwards of two years and was still using the original brushes. In the first case, there was much "sparking"; in the second, no "sparking" was ever observed; the "wear and tear" of that instrument was practically *nil*.

From the above it would appear that the life of a dynamo ought to set at a very high figure, provided due care be taken of its hearings, and the adjustment of its brushes. Its cost of maintenance should be nothing more than an occasional pair of brushes and the renewal of the commutator.

The Flora of Bank Notes and Coin.

Science and Nature, a French journal has published an article entitled "The Flora of Bank Notes," from which it appears that bank notes are more or less covered with animalculæ, as well as coin, which latter fact has already been advanced to the world. From the article in *Science and Nature* we learn that M. Jules Schaarschmidt has followed out the investigations of M. Reinsch, who found, with the aid of the microscope, that two species of algæ adhere frequently to coins. Schaarschmidt has examined bank notes and found that the paper currency of various countries furnishes an abundant cryptogamic vegetation, as well as microbes.

Nature, commenting on the subject, remarks: "There is obviously a very serious side to all this, however, if further researches prove that, as appears possible, our most minute and dreaded enemies are always in our midst on such apparently welcome visitants as coin and bank notes, money will have earned a worse name even than it has heretofore. *En revanche*, there are two points which no doubt will be insisted on. In the first place, the observers named have not so far described any organism on the money investigated which is known to be inimical to us; and, secondly, precautions have been taken from time immemorial against the transmission of currency passing from a plague-stricken community to a healthy one. Possibly the facts derived from these observations will be made use of to bring more forcibly before the minds of our less careful brethren the dangers of handling "filthy lucre" in times of disease."

EQUALIZATION OF TEMPERATURE.—If several months in succession have been unusually warm or unusually cold, instead of concluding that the climate has permanently changed, and that the succeeding months will be similar in character, we should rather anticipate months of the opposite description, since the mean temperature of the year fluctuates within very narrow limits, and the longer a period of unusually warm weather continues, the greater is the probability that the succeeding months will be unusually cold. Predictions of this kind are legitimate deductions from scientific data. When we are restricted to observations at one locality, our predictions of the weather must needs be more uncertain, and the conclusions to be derived from a motion of meteorological instruments are not the same for all parts of the world. A considerable and rapid depression of the barometer, for instance a fall of three-quarters of an inch in 24 hours, indicates an approaching storm, with rain or snow. A rapid rise of the barometer indicates unsettled weather; a slow rise indicates fair weather. The result of all rapid changes in the weather, or in any of the instrumental indications, is brief in duration, while that of a gradual change is more durable. Remarkable clearness of the atmosphere near the horizon and an unusual twinkling of the stars indicate an unusual humidity in the upper regions of the atmosphere, and are therefore indications of approaching rain. Halos, coronas, etc., presage approaching rain or snow. Dew and fog are indications of fine weather.

THE PRODUCTION OF INTENSE COLD.—In his third lecture on "Natural Forces and Energies," delivered at the Royal Institution on April 30th, Professor Tyndall referred to some interesting news he had received that morning from Austria with regard to the latest development of a line of research inaugurated by Faraday. By reduction of temperature and increase of pressure Faraday had conducted the classic experiments which had led to the liquefaction of chlorine, and subsequently of other gases, but oxygen and carbonic acid and others resisted all the resources for producing cold and for exerting pressure which he could then command. Subsequently carbonic acid had not only been liquefied but solidified, and "carbonic acid snow" is not unfrequently made. It was but yesterday (said Professor Tyndall) that we heard from Switzerland that oxygen had been liquefied, and the news of that day was that it had been solidified. The experimenter was Professor Wroblewski, of Cracow, and the degree of cold employed was 365° C. below zero, when crystals of oxygen formed and a coating of ice covered the surface of the liquid oxygen. The greatest degree of cold known when Fahrenheit fixed his thermometer scale was by a mixture of ice and salt, only 32° below the freezing point of water being obtained.

COAL AND ITS FORMATION.—A scientist lecturing in Philadelphia on coal, said it takes a prodigious amount of vegetable matter to form a layer of coal; that it is estimated that the present growth of the world would make a layer only ¼ of an inch thick and that it would take a million years to form a coal bed 100 feet thick. The United States has an area of 440,000 square miles of coal fields; 100,000,000 tons of coal were mined in this country last year, enough to run a ring round the earth at the equator 5½ feet wide and 5½ feet thick, and there is enough coal in the United States to supply the whole world for a period of 1,500 to 2,000 years.

When the coal is burned for illuminating purposes, at least 90 per cent is wasted. In the heating of houses 67 per cent is lost, and in manufacturing 90 per cent of the energy is made use of. The question of the exhaustion of the coal supply is not important. The anthracite coal in Pennsylvania would last 250 years while the bituminous coal in the same district would supply the world 57 years and the United States 350.

CONSTITUTION OF CLOUDS.—M. de Tromelin attacks the hypothesis that clouds are composed of vesicles or hollow spheres of condensed vapor. He supposes that every solid body, whatever may be its diameter, retains around it by adhesion a special atmosphere of the gas in which it is plunged; that the thickness of this atmosphere, is nearly independent of the volume of the solid body; that the attraction which retains it is within the domain of the molecular forces and is manifested only within very short distances. In this way he accounts for the difficulty of completely removing the air from a tube which is to be filled with liquid. In the case of a vesicle surrounded by its atmosphere the thermal absorption of the water is much greater than that of the surrounding diathermanous air. The atmosphere of the vesicle is consequently expanded and the particle with its atmosphere floats hy displacing an equal volume of the circumambient air. The dust particles which are observed in the sun's rays are supposed to be sustained in the same way.—*Les Mondes*.

THE GREAT OBJECT GLASS.—A casting has been made of the crown glass for the great Lick telescope, which, it is thought, will be a success, after quite a number of failures. Such is the report brought hy Mr. Chas. Plum, one of the trustees of the Lick estate, who has just returned from Europe. It is said the failure of the previous castings has been on account of a change in the management of the glass works, the father having given up the management to the son, who was comparatively inexperienced. The father has recently gone back, and the result has been the restoration of their works to the former standard of excellence, and now we have the report that success has attended the last casting, which is being polished to facilitate a more thorough examination of its character. It is expected that it would soon be ready to ship to Clark's at Boston, who will give it its configuration, and they as well as the trustees feel quite sanguine that there will be no further delays. The object glass will be 36 inches in diameter, and costs $50,000.

ACTION OF DYNAMITE.—The recent trials of projecting dynamite shells hy the use of ordinary gunpowder and their wonderfully destructive action has aroused much curiosity as to the manner in which this powerful explosive acts—so different from that of gunpowder. It is explained that hy reason of its quickness of action the armor of a ship or the wall of a fort, in a word, the solid offers less resistance than the miles of atmosphere surrounding. This has been shown by a recent illustration. By placing 100 pounds of gunpowder on a hard surface, then applying a light to it, an explosion would of course follow, and the explosion would take an upward course; but should 10 pounds of dynamite he placed in a like position and exploded the action is so quick that after being fired it would tear up the earth for many yards around.

A NEW KIND OF FISH is said to have been found in the waters of the Suwanee river. They seem to be a cross between the salmon and shad, and are said to be of a fine flavor.

MINING AND SCIENTIFIC PRESS.

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Saturday Morning, June 20, 1885.

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Passing Events.

The excitement in Arizona on account of the Indian outbreak is increasing, and the citizens are asking the Government for better protection than that afforded by the few troops there. A number of settlers have been killed and the Indians have not yet been punished.

Increasing interest is manifested in the gold-mining regions of California, and developments are being pushed at a more rapid rate than has been the case for some years. More prospecting is being done also, especially in the northern counties, where hundreds of men have gone this summer.

The cutting down of force in the railroad companies has thrown many persons out of employment, and this week further reduction has been made. Several of the officcs have been consolidated and some have been abolished.

Our correspondent who is traveling in Shasta and Trinity counties is gathering very interesting information for his weekly letters, one of which appears in this number of the PRESS. These letters are worthy of careful perusal.

MILLS' SYSTEM OF SHAFT SINKING.—In the articles on this subject which appeared in the PRESS of last week and week before, were one or two errors. In the second paragraph of the first column, page 761, the "flow" of the American valley should have been the "floor" of the American valley. On the tenth line from the bottom of the same column the word "forced" should be "passed." On page 377 (last week), in the second column, seven and eight lines from the bottom, the tranposition of the word "shos" confused the sense. It should read "the load was taken out of the barrel through the opening (*I*, Fig. 4), just over the shoe with" etc. On page 378, first column, fifth line from the top, instead of "one and one twenty-first" it should read "one twenty-first." These corrections should he made by those who are keeping the article for reference.

Yield of Auriferous Gravel.

The ordinary yield of the gravel channels in the northern counties of this State is from $40,000 to $50,000 per acre, though there are exceptional instances of much greater production—in one case at French Corral, Nevada county, reaching nearly $200,000. In the southern counties the gravel deposits are not so deep and the product has varied from $10,000 to $40,000 per acre. It has been estimated that it would take 50 years to work out ground already opened and controlled by the present canals and reservoirs, providing hydraulic mining had not been prohibited by the courts. It was judicially found in the Woodruff case, in which only the mining region on the tributaries of the Yuba was considered (although the principle affected all hydraulic mining), that "approximately, according to the evidence, over 100,000,000 cubic yards from these mines had been washed out by ths hydraulic process," and 700,000,000 cubic yards remain to bs washed out.

The basis of valuation of hydraulic ground predicated on returns per cubic yard has long been obsolete. Ths measure of value is ths product per miner's inch of water; this in some instances bas reachsd as high as 41 per inch.

The effective results of watsr on hydraulic hanks, determined hy close observation in 1882 at several leading mines, are thus tabulated hy Walter A. Skidmors, Secretary of the Minsrs Association :

Mine.	Water. Miners' in.	Earth Moved. Cubic yds.
North Bloomfield.....	2,800	11,200
Milton.....	3,300	11,400
Omega.....	1,500	7,500
Conly & Cowell.....	1,700	10,200
Excelsior.....	1,600	6,400
Chadwick & Campbell.....	1,200	14,400

These observations Mr. Skidmore says were made simultaneously, but the conditions were varying with respect to tbe consistency of the gravel. The result will show a duty of an average of five cubic yards per miner's inch in Nevada county, though this would include some top dirt.

The Strike at the Mayflower Mine.

We mentioned recently that a rich strike had been made in the Mayflower gravel mine, about a mile and a half northwesterly from Forest Hill, Placer county. Wonderfully rich gravel has been found. The mine has been skillfully prospected hy the superintendent of the Mayflower Company, Mr. Felix Chappelet. They own about a mile and a half on the main channel, which is probahly the same channel as that on which Breece and Wheeler are at work, as the gold is of precisely the same character.

They first started hydraulicking a hed of gravel 100 feet deep overlying white cement. They tnen sunk a shaft 150 feet, and struck gravel when they passed 50 feet. They then found a riu pitching east, and drifted easterly 500 feet through gravel. There they eunk shaft No. 2 about 82 feet throngh gravel when thsy came to bed-rock pitching east. From here they drifted southeast 500 feet and struck hed-rock—supposed to be the east rim. Winze No. 3 was sunk at a distance of 300 feet from shaft No. 2, and at 135 feet hed-rock was met. From the bottom of shaft they drifted east 160 feet and found the bed-rock pitching east.

A slope was sunk on the bed-rock, at about 18 degrees, a distance of 100 feet, and here pay gravel six feet deep was struck which yielded $400 per pan. In five days thsy took out 300 ounces. This is from hard cemented bluish-gray ground, containing quartz, trap, syenite and hard ribbon slate boulders. It is similar in all respects to that worked hy Breeee. & Wheeler, at Bath, about two and a half miles east of this ground.

Great difficulty was encountered in handling the water, during this most excellent piece of prospecting. First it was uecessary to place an 8-inch Cornish pump in the main shaft, run hy an engine on top; and also a steam pump. On shaft No. 3 water was hoisted by donkey. At the hottom of No. 3 they are using two steam pumps; and at ths hottom of the slope thsy also have a steam pump. The steam for all the pumps ie furnished by a boiler on the surface, and passes through a two-inch pips a distance of 1,300 feet, the pipe being protected with felt. A fan is used for ventilating. The mins is now in proper shape for rapid and easy development and the character of the gravel is such that the owners are sure of an exceptionally rich yield.

Since writing the above we learn that the mine is increasing its weekly returns at a rapid rate, it heing now over 1,000 ounces, with good prospects. It is the company's intention to run a tunnel to facilitate the work, and increase its returns. Mr. Chappelet, the superintendent, is quite energetic, and his management is highly complimented by thoss familiar with it.

A new company called the Live Oak Drift and Gravel Mining Co. has just started on a mine situated close to the Mayflower.

Growth of Gold Mining in California.

We infer from accounts that reach us through our own correspondents and othsr reliahls channels of information tbat the business of mining for the precioue metals is being fairly prospered in California, and that the pressnt, taken as a whole, is likely to prove a really good year for ths industry. Ths self-employers, who constitute a large proportion of our mining population, appear to he making at least average earnings, while those working on hire are receiving, if not very hig, certainly what are satisfactory wages, for a spirit of contentment seems to everywhere prevail. We hear of neither labor strikes nor complainings: pretty good evidence that all classes, employers and workmen alike, are acting in harmony; certainly that tbere exists no great friction hetween them.

In this husiness, as in every othsr, the measure of success is, of course, variahle: some make fortunes in a very short time: others make barely wages, while occasionally an enterprise proves wholly non-remunerative. On an average, however, gold mining in this State is paying hstter than any other hranch of husiness either here or elsewhere. And an encouraging feature of this husiness is that it is progressive: it is all the time improving; even in the matter of profit realized it is doubtful if it has seen its hest days; its great successes lie in th e future. We are persuaded of this is when we look ahout and see what is being done, and measure the possibilities of the situation. And others are persuaded of it. Hence this general waking up and these many silent movements of our capitalists, mining magnates, husiness men aud others in the direction of new and more extended mining operations.

Taking for data what is being done in Nevada county alone, or even in a single district in that county, it would denote for this industry a new departure and a more rapid growth in the future. In Washington Township and district, in that county, agencies have lately heen eet to work that must, in the couree of a year or two, materially increase the hullion product of this State. The records of that section of country hecome at this time instructive, not only for the light they shed upon the past history of quartz mining in California, hut becauss of their hearing on its probahle future. Here some of our most successful vein miners made their first efforts in that line of business, and here, after an absence of nearly quarter of a century, they have coms back to pursue it. Here George Hearst was working quartz in 1859, when the fame of the Comstock find caused him to suspend oparations and betake himself to other and new fields of enterprise. What he, in connection with Haggin, Tevis and other millionaires, has since accoinplished in ths way of securing and opening up valuable mines, we all know. The methods these men havs adopted, and which have contributed so much towards insuring success, are also well known; their plan havi g heen to always thoroughly prospect mines hefore huying them, and in no case to accept any property of this kind until i s valne had been pretty well established. In every instance where these men have bought and equipped a mine, it has turned out well. The fact that they are now largely interested in the Washington District, having already erected a mill on one of their claims there, the Yuha, argues well for that as a quartz mining locality.

That this quartz belt striking across the Washington and Eureka Districts is really ons of the most permanent and productive ever found in this State is ehown further hy the fact that every mine ever opened and supplied with plant upon it has made eatisfactory returns, some having heen worked almost continuously for over 30 years. Only within the past year or two, however, has any first-class mill heen put up, or much thorough and systematic work heen done. Ths following mills, nearly all of recent construction, are now running in the district: The Eagle Bird, 20 etamps—crushing capacity soon to be douhled—Shattuck & Co., of San Francisco, owners; mill and hoisting works run hy water, crushing 30 tons daily, average yield $25 per ton; cost extracting and milling, $3 per ton; 15-foot vein all good ore; opened to depth 200 feet, ore all from drifts, no stoping yet done. Yuba, 15 stamps—owners Hearst, Haggin & Co.; run hy water, raise and crush 30 tons daily at a cost of $4 per ton; yield, $25 per ton; 6-foot ledgs at a depth of 600 feet, all good ore, mill soon to he snlarged. Lindsay, 20-stamp mill, run by water, owned mostly hy Greathouse, Robinson & Bell, of San Francisco—old mins paid largsly for many years; strong vein of $20 ore, which can he cheaply mined and milled. Cornucopia and Secret Treasure, 10-stamp mill, owned hy English Company; 4 lodes, average width 8 feet, ore yields $18 per ton, mined and milled for $3; largs ore rsservss developed. Gaston Ridge, 10 stamps, owned hy locators and worked on lease; has been worked for 20 years and paid well; ore yields $15 to $20 per ton; strong vein at a depth of 100 feet, all ore; cost of extraction and milling, $2 to $3 per ton.

Besides the above there are two or thres small mills in ths nsighhorhood, with ssveral new ones of large capaoity, either projected or in courss of cons'ruction, it heing calculated that the number will be doubled inside of another year. While the mills already put up ars on such valuahls ledges as above described, thess latter do not in all cases embrace the hest properties in the district, as more recent developments tend to disclose. The Gamhrinas, formerly the California, sitnated on ths eminence known as ths Gaston Ridge. The Mountaineer located opposite the Eagle Bird and Yuha; ths Celia, adjoining the Eagle Bird on the south; the Crœsus, lying east of and close to the Yuha; the Selina group at the head of Little Canyon creek, and on the same range with the Yuha and Lindsay, and which undonbtedly exceeds either of these mines in value; the Serius, another unmistakably fine property, the Regina and the Excelsior, hoth yielding high grade ore in quantity; the Grant, a promising vein, situated on Phelp's Hill, and developed hy several tunnels, not to mention a dozen other gold-hearing lodes in the vicinity, all showing good prospects.

It should he stated that there is au ahundance of fine timber in this region, also water enough, much of it still free, to drive a thousand stamps or more. Machinery can he taken into this district at small cost, it having heen connscted with the Central Pacific Railroad by means of a narrow gauge track recently laid down by the Towle Bros.

Modern Mine Cages.

We have on this coast, in all well appointed mines, been so loug accustomed to hoisting in guided cages that we scarcely know how much of an improvement they are over ths old-fashioned skip. The rapidity with which hoisting work is done with these cages is one of the reasons why such quick work of development as we see is possible. To the modern cage is due much of the cheapness with which ore is mined in large quantities, as hy its means tbe material is readily and economically handled.

To show what a difference there is in hoisting by other means, the expsrience of one of the collieries in the Department of the Loire, France, may he cited. At the mine referred to it was the custom, until recently, to hoist from two shafts hy means of the old-fashioned skip; hut a new managing engineer advised the adoption of guided cages, and in a few months the change was affected. As the shafts were of small diameter, the cage was constructed with four stages to carry one tub eaeh. Now the whole of the winding is done through ons shaft with a larger output than formerly, and the results of the last three months' working with these new arrangements show a reduction of 2 fr. (1s. 8d) a ton, or about 18 per ccnt on the cost of production. The shaft is 440 yards in depth.

A Water-Gas Open-Hearth Furnace.

The following paper, by N. Lilienherg of New York city, was read at a recent meeting of tho American Institute of Mining Engineers:

The success of European experiments in melting iron and steel with gases resulting from the decomposition of steam hy incandescent coal, has encouraged me to design, with the valuahle assistance of Mr. George S. Dwight, a plan for producing and hurning these gases in a manner economical aud efficient for metallurgical purposes. That this direction is the right one, is demonstrated by the repeated efforts made in practice, to introduce as much steam as possihle with the hlast in ordinary producers, thus displacing a certain amount of nitrogen. Such attempts, however, must always bc limited hy tbe cooling influence of the steam.

The accompanying drawings represent the producers and the steel-melting furnace, arranged according to our first ideas which may be susceptihle of improvement in details when put into practical use. In the engravings the scale is the same, and the same lettering is employed for the differeut sections.

The apparatus contains two above-ground circular producers, *a*, *a*, provided with the ordinary hell and hopper for charging. The fire-hrick lining is contracted ahove and helow the middle. The upper parts contain outlets for the gas uniting into circular flues. The lower cones rest on cast-iron plates and circular pipes *b*, *b*, which are supported hy the angle irons *c*, *c*. By hanging these with the irons *d*, *d*, the entire ash-pit is left free from obstructions and can he cleaned through four doors. It is important to have this free space, especially when air and steam operate alternately on the coal, hecause the ashes partly melted hy the blast get cooled off by tbe steam, thus sometimes forming large lumps. The circular pipes, *b*, *b*, have continuous openings and aro united hy a hlast-pipo *e*, containing two valves *f*, *f*, placed at right angles and connected hy a lever-apparatus. The innor and upper edge of the circular blast-pipes can be protected, if necessary, by a pipe with running water.

In the lower part of the producers are two outlets, *g*, *g*, for the gases, which connect outside into the pipe *h*. They are alternately shut off hy the slide-valves *i*, *i*, connected hy a rod *k*. The hlast and gas-valves are operatod simultaneously hy the standing shaft *l*, having the levers *m*, *m*, *m*. The flues in the upper part of the producers are connected by an apparatus *n* similar to the slide-valve-regulator in a steam-engine, the valve *o* heing operated hy a combination of levers *p*, *p*, and a rocking shaft *q*. Steam is admitted into the chamher through the pipe *r*, and regulated hy a valve, whereby the admission of gas to the furnace is also regulated. Under the slide-valve runs the flue *s*, connecting with the pipe *t*, which terminates in a pit *u*.

It will thus he seen that in this position of the valves shown in the drawings, the hlast passes upward through the left-hand producer. The escaping gases, consisting of carbonic acid partly converted into carhonic oxide, and containing the whole amount of nitrogen of the blast, pass off at the top and run under the valve into the flue *s* and the down-comer *t*. On the other hand, steam passes ahove the valve into the other producer previously heated hy hlast; and the product, containing hydrogen, carhonic oxide and a trace of nitrogcn, passes off helow into the pipes, *g* and *h*. Reversing the valves hy means of two levers reverses the currents, the steam then passing through coals previously heated and the hlast through the coals cooled off by the steam.

There is consequently a constant supply in the pipe *t* of poor gas containing all the nitrogen of the hlast, and a constant current iu the pipe *h* of pure water-gas of high calorio power. By admitting air into the pit, or combustion chamher *u*, the carbonic oxide is hurnt, the flame passing off into the flues *v*, *v*, which constitute a heat-restorer. This part of the apparatus is constructed of 3-inch firebricks of 15-inch hight covered with two layers of 3-inch bricks, leaving channels of 9 inch width. The water-gas passes from the main flue down into the four channels marked "Gas," and is preheated by conduction through the walls. The air passing through the four chaunels on the opposite side is preheated in a similar way. It will thus he seen that explosions could not take place hy air and gas mixing through cracks in the hrick walls. The waste gases contiuue through the flues *v*, *v*, down into the chimney flue *w*. The air and water-gas continue their course and ascend into the flue *x* (See cut, longitudinal section), which is divided hy the wall *x* cross section C-D).

If these producers are somewhat more complicated than the ordinary ones, the melting-furnace is cheaper in construction than the Siemens regenerative furnaces. The superstructure consists only of four flues 1, 1, separated hy hrick walls and arches, 2, 2, with an opening 4, in the center. The air and gas flues communicate on hoth sides with the flue *x*, while the inner and lower channels open into the flue marked "waste heat" (at the right-hand end of the longitudinal section), whence the escaping flame passes through the channels 5, 5, in a way similar to the flow of the waste gases from the producers at the opposite end. It will thus he seen that the air and the water-gas in a preheated state meet under an oblique angle, creating an intensely heated flame, turned directly on the metal in the deepest part of the hath. From theuce the flame passes into the flue through the channels terminating in the chimney flue 6. The air and water-gas consequently pass toward the furnace through channels in which the heat gradually increases, as the furnace is approached.

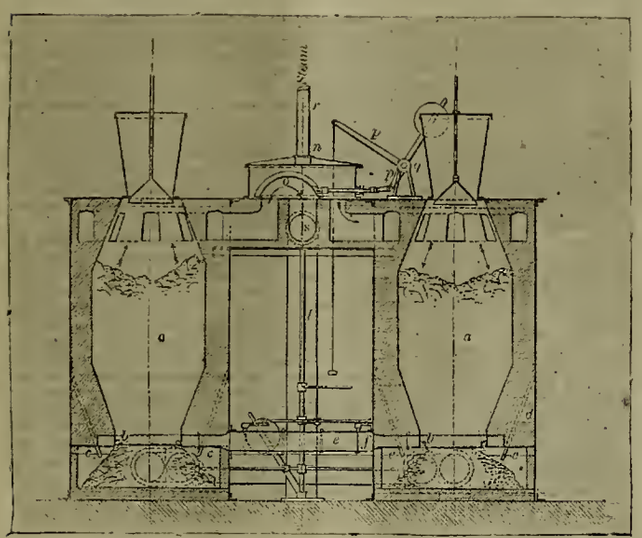
The repairs of the channels are affected by shoveling away the sand filling and lifting up the hrick cover. This is not much more work than hreaking through the walls in the ordinary Siemens regenerators.

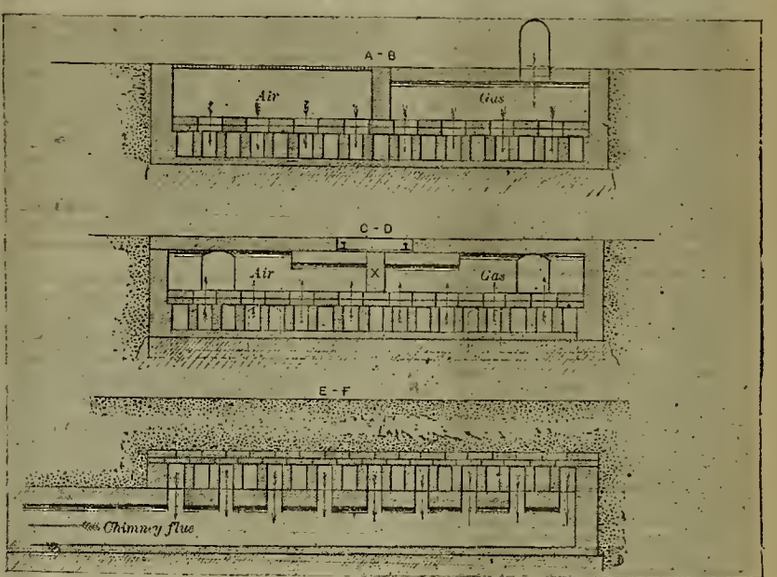
The space between the producers and the furnace is used for the transport of raw materials for the furnace charges. The furnace bottom is loose on wheels 7, 7, so that it can be easily removed and repaired. During the melting it is elevated on the two beams 8, 8, thus relieving the wheels from strain. By taking away some wedges it drops down on the wheels, disengaging itself from the superstructure. In this way it is also possible to use a hottom of hasic materials, hecause they do not come in contact with the siliceous superstructure.

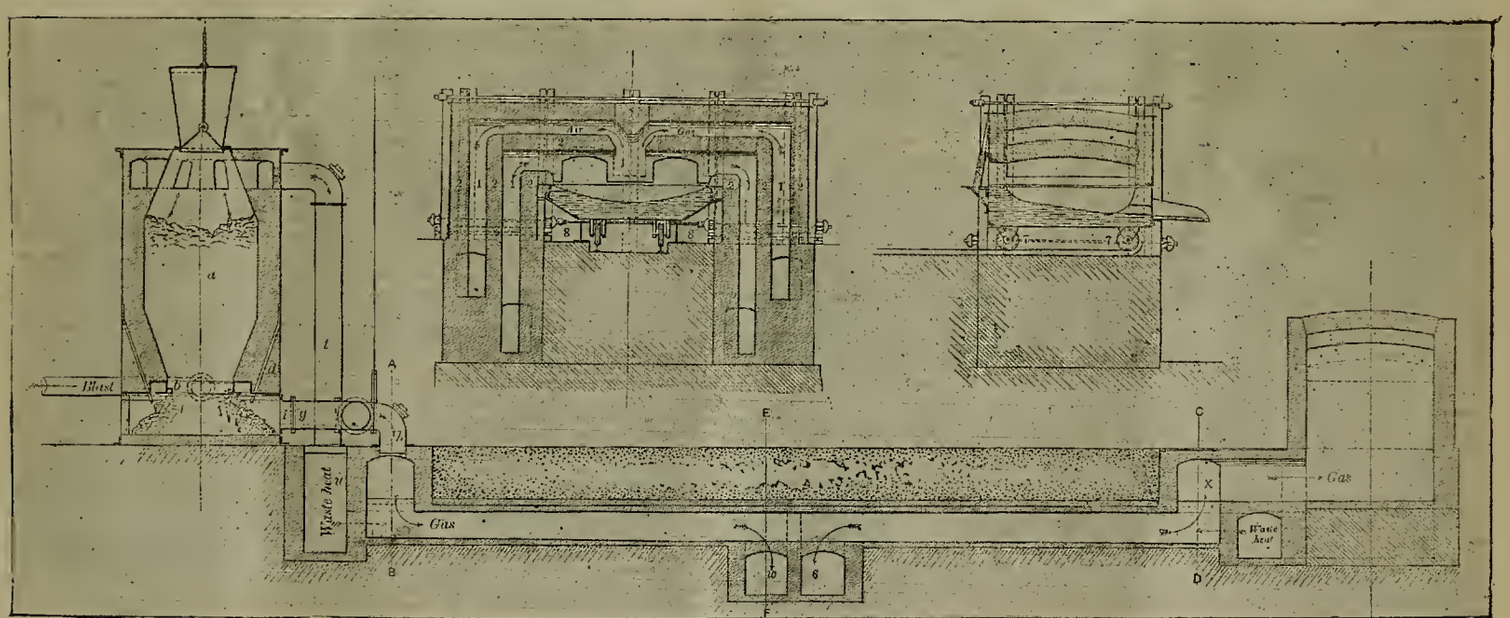
According to Mr. George S. Dwight's experience in producing water-gas for illuminating purposes, the most economical results arc ohtained hy a high pressure on steam and hlast, and hy short periods hetween the reversals.

If at any time the ordinary diluted gas charged with nitrogen (Siemens gas) should be preferred, one producer can he operated without reversing, openings heing made at a sufficient numher of points through the hrick wall hetween the two flues.

It is evident that the system can he used also for welding or heating purposes, in which case the air and gas can he introduced at the end of tbe furnace instead of in the center.







PRODUCERS AND STEEL SMELTING FURNACE TO BE WORKED BY WATER-GAS.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

LIFTING APPARATUS.—C. Sanhorn, assignor one-half to A. T. Dewey. S. F. No. 319,132. Dated June 2, 1885. This is an improvement on that class of lifting apparatus known as "lock-pulleys." It was illustrated and described in the PRESS of September 13, 1884.

ORE CONCENTRATOR.—Norman Butler, Ennis, Montana, No. 317,621. Dated May 12, 1885. This concentrator is of that class in which the ore pulp is deposited upon shaking tables whose motion separates the particles of different specific gravities. A combination of devices is covered by the patent, so as to make an effective concentrator.

WHIP-SOCKET.—Cephas L. Bard, San Buenaventura. No. 318,531. Dated May 26, 1885. This whip-socket has one or more air-hulhs or cushions projecting within the harrel of the socket and adapted to bind upon the stock of the whip, and has a peculiar bearing plate in the hottom of the socket. The ferrule cannot chafe, and the whip-hutt is protected from water as it trickles down.

RAILWAY SWITCH.—George Chalmers, San Juan, San Benito Co. ,No. 319,067. June 2, 1885. This is a switch of that class in which levers in the road-hed are operated hy suitahle devices for the passing locomotive to throw the switch rails into or out of connection with the main or side track. The invention consists in a novel arrangement and construction of the levers in the road-hed, and in the novel arrangement of devices on the locomotive, hy which said levers are operated.

FOLDING-BED.—Benjamin F. Farrar, S. F. No. 319,083. Dated Juue 2, 1885. It consists of a sectional mattrass or hed, ths sections of which are hinged together at their meeting ends, of suitahle legs for supporting the foot and sides of the mattrass, and a swinging leg for supporting its head, and of a peculiar arrangement of rollers or casters at the head and foot to carry the ends of the mattrass sections in turning from one position to another, and to support them when folded.

PROCESS OF GRAINING SKINS.—Emil Schroeder. S. F. No. 319,136. Dated June 2, 1885. This is an improvement on that portion of the operation of tanning skins known as "graining." In the treatment of such skins as require to he turned out soft and pliahlc—notably, huckskin—it is necessary to remove the grain after the hair has heen sweated off. By removing the grain is meant the taking off of the outer layer of the skin to render the underlying surface somewhat similar to that of the inner surface, known as the "flesh side." Heretofore this has heen done hy the use of oxalic acid, which loosens the grain and allows it to he removed. In this improvement theungrained skin is swahhed with a certain mixture of acids which does the work more perfectly than the oxalic acid.

ADJUSTABLE ELEVATOR-SUPPORT FOR DERRICK WAGONS.—James Carleton, Willow, Colusa Co., assignor one-half to E. M. Tyler. No. 319,066. Dated Juue 2, 1885. This is a vertical frams, in the sides of which a cross-head or rest is mounted and adapted to be vertically adjusted hy means of an adjustable lever and connecting links, and in a supplementary axle provided with a bolster on which the vertical frame is supported; said axle being attached to the rear axle of the derrick wagon hy means of pivoted cross-reaches and a connecting har, wherehy the whole device hecomes a part of the derrick wagon and accompanies it. The object is to provide a permanent support for the elevator, adapted to adjust it to a suitahle inclination, and thus to avoid the lahor requircd to ship and unship the elevator and place it in position.

HEADER.—Chas. H. Deane, Hopeton, Merced Co., assignor one-half to H. C. Shaw, of Stockton. No. 319,075. Dated June 2, 1885. The essential novelty in this header is that ths draper-platform has a movement independent of the main frame. It is usual to hinge the post-heam to the main frame, and form the draper-platform a part of the frame. Then to adjust the sickle for a high or low cut the whole frame is moved on its wheels, as a fulcrum; but in this machiue the frame remains steady, and the draper-platform alone moves to an inclination. Therefore, it is not nscessary to hinge the post-heam to the main frame, but it can he secured solidly to it, so as to make a firm and strong machine. Then, again, having nothing hut the platform to adjust there is no great weight, and the lever can he operated easily, thus admitting of dispensing with springs and weights, which are ordinarily used to assist the lever in turning the whole machine.

MANUFACTURE OF BEET SUGAR.—Edward F. Dyer, Alvarado, Cal. No. 319,077. Dated June 2, 1886. This is an improvement in manufacturing beet sugar and in the treatment of molasses, wherehy the inventor ohtains an increased yield of sugar and greatly shortens the time of manufacture, saving the expense of hoiling in tanks for crystallization, the cost of expensive crystallizing tanks, and the expense of handling the low products. as well as the chemical and mechanical loss hefore it is converted into sugar. The ohject of the improvement is to separate from the molasses the greater portion of the matter therein contained, which prevents the crystallization of the sugar, and which cannot he removed hy the usual methods of manufacture. The inventor thus increases its purity co-efficient so that it may hs hoiled to granulation in the strike vacuum pan, and the entire sugar from the beet may be ohtained in one product.

HEAT REGULATOR.—Lyman C. Byce and Alzino Dias, Petaluma. No. 319,064. Dated June 2, 1885. This invention relates to that class of heat regulators in which an expanding and contracting substance is caused through an intermediate mechanism to govern or control the source of heat, wherehy the temperature of an apartment may he kept at a certain degree; and this invention consists in a novel channel or passage, in connection with the heat source, and adapted to divert the heat when necessary, a valve adapted to close said passage or channel when the heat is not to be diverted, and to open it when otherwise, and in a peculiar valve-operating mechanism affected hy an expanding and contracting suhtance, thermostate, or regulator within the apartment. The invention further consists in the application and location of these parts in connection with an incuhator, wherehy certain beneficial results are effected. The ohject is to provide a simple and effective heat-regulating device, which, though applicahle to any apartment, is specially applicahle to an incuhator.

STEERING MACHINE FOR HEADERS AND THRESHERS.—Wm. H. Parks, Jr., Marysville. No. 319,117. Dated June 2, 1885. This new method of steering headers and threshers consists in an arrangement of levers, pulleys and ropes, hy which the operator is enabled to stand in the most convenient position for seeing his work ahead, and from which he is enahled through the ropss to operate the steering-wheel. The ohject is to enahle the steerer to locate himself in such a position that his view of the field in front will not be obstructed hy the intervening machine, and at the same time give him the necessary means hy which he can govsrn the steering wheel. In machines of this class the thresher portion is usually so cumhersome as to entirely cut off from view of the steerer the work ahead, and he is under the necessity of guiding his one-horse by signals given hy other persons. This is a great disadvantage. Mr. Park's invention contemplates the location of the steerer upon the platform of the header portion of the machine, in which position he is at one side of the thresher portion and can see through the header portion, which is generally of such light frame-work as not to ohstruct his view.

OAKLAND HARBOR.—The failure of Congress at the last session to provide for the prosecution of work on the river and harbor improvements of the country will seriously delay the completion of the various projects under way, and will cause considerahle loss to the Government. When the usual annual allowance is withheld, the engineers are compelled to curtail the lahor required under each plan, as it is necessary to retain a portion of the money on hand to meet any sudden contingency, such as damages caused by floods, and also to provide for the preservation and care of the engineering plant needed to carry ou the work of improvements. Of course the rivers and harhors of California will suffer with the rest hy this delay, and the large commercial interests involved must of necessity he seriously inconvenienced. First as to the Oakland harhor. The original estimate for this improvement was $1,814,529.20, of which amount there has been already heen appropriated $874,600, leaving to he yet provided for the completion of the project $939,929.20. In reference to future Congressional allowances for carrying on the work at this point the engineer says that "these operations are of considerahle magnitude and can he hest prosecuted hy appropriations equal to the yearly estimates. Small appropriations prevent economical working. At the present rate of appropriations it will require ten years to complete the work, which could he well done in three or four years." An appropriation of at least $300,000 will therefore he asked of the next Congress, which, if granted, will he applied mainly to increasing the tidal prism by continuing the dredging of the tidal hasin or hy heginning the excavation of the San Leandro canal. The depth of the entrance is 14 feet. The original depth beforc the improvement was hegun was 3 feet.

REDUCTION WORKS.—The Pioche *Record* gives the following practical remarks on this suhject: "This part of the country is in need of reduction works; works that can work ore that assays from $30 and upwards. There are large quantities of ore along the range, but as there are no works for its reduction it is of no account. The $60 ore is not worth extracting for the miner can get nothing for it. The buyers cannot afford to purchase it and ship it to Salt Lake for reduction. They can afford to purchase none but ore of high grade. Reduction works for the working of low-grade ore, located down ahout the Eight-mile House, that would deal fairly with the miners, would yield an immense profit to its owners. The mines along the range from Stampede to Bristol Divide, would be worked and the reduction works kept busy, hut at the present state of affairs men are unahle to get anything for ore that assays less than $100. If it be true that it pays to work $12 ore or less in Colorado, we know no reason why from $30 to $60 ore should not pay in Nevada.

Lower California Copper.

The Butte *Inter-Mountain* says: News has just heen received in this city of the purchass, hy a French syndicate composed of some of the Lexington officers and Baron Rothschild, of London, of a vast tract of copper country in Southern California, on the east side of the hay of California, opposite Guaymas. The country embraced within the purchase is four miles wide and fifteen miles long, and is trasversed longitudinally by three great ledges carrying 12 per cent copper, which occurs as carbonates and oxides, in a sandstone formation. The property was examined last June hy Mr. Wartenweiler, of ths Lexington company, and hy Messrs. DeLahouglise and Cumence, other well-known mining engineers. The amount paid for the property is not stated, hut the sale is reported to he one of the heaviest made in Europe this year. A smeltiug plant will he at once erected to trsat the ore and a copper product of 12,000 tons per annum is promiscd. There is hig money in the enterprise, as English coke can hs laid down at the mines for $9.75 and other transportation will be comparatively low. It will probahly be fully a year hsfore the company will he ready to msrket its product. It is stated that Mr. Wartenweiler has made a handsome stake as a result of his participation in the enterprise, hut with his accustomed modesty he denies this assertion and refuses to make any statements for puhlication.

DEEP BORING.—The artesian well at White Plains, Nevada, is down over 2,300 feet, and can go no further until the water is shut out. It is 17 per cent salt, and is so heavy that the rope and tools float in it, and the drill does not penetrate the rock. All attempts at shutting it out have failed thus far. The Reno *Gazette* says that the msn are now at work on the last resort. It is an ingenious contrivance, consisting of a hollow cylinder of two-inch ruhber, two feet long and of a diameter sufficient to fit around the iron pipe. This is put on the pipe a foot or two from the hottom, at a joint. When it goes down into tho well, the tons of pipe above it press down and expand it, filling every crevice in the well completely, and shutting off all flow, up or down, outside the pips. Then if the rock is not porous or full of crevices, there is a good joh. Mr. Chapin and his assistants are interested now in this question, for upon it depends success. They have put down the pipe once, hut the rubber came off last Saturday and is at the hottom of the well. They have heen fishing for it ever since, and got out two pieces yesterday. Thsy are going to put the pipe down again and fish the ruhher up through it. An iron with harhs on it is used for fishing. The pipes are 4½ inches in diameter, and 1,890 feet long. It is lowered into the well and the points secured on as it goes down. The hig rope hroke on Monday near the reel, hut caught in the hlocks, so the end did not go down in the well. A new rope 2,500 feet long is needed. They cost nearly $1,000 apiece.

CONCENTRATING.—In Inyo county 100 tons of lead ore were recently concentrated down to 20 tons at a very small cost and nearly all of the precious metals retained. The papers of that county say that the concentrating proccss will soon he extensively adopted in that section. The same system will be ultimately adopted in this section. There are hundreds of ledges that yield rock which gives an average assay of ahout $25 per ton. A working test returns say $10 per ton in gold and the remainder goes off in rich iron and lead sulphurets with the tailings. It costs $5 per ton to mine this ore, $2 per ton to haul it, and $5 per ton to mill it. The rcsult is that either the miner, the teamster or the mill man must lose $2 on every ton worked. One or two dollars additional expense would concentrats these tailings as they pass from the battery. Ten tons would therehy he reduced to one, worth $100, and which would probahly nst the owner $60 or $70. Then, instead of losing $2 per ton, they would he making a profit of $3 or $4 per ton, and this seemingly small amount is what decides the fate of many a flattering prospect. It will not he many years until the hills will he full of small mills, cousisting of a hattery, plates and concentrators, in active operation. In many places the free gold taken from the plates will pay all expenses, and the proceeds from concentration will be clear profit.—*Carson Free Lance.*

Helena, M. T., business men are planning to have a smelter there. Committees were appointed to ascertain facts and figures from the various mineral districts in the vicinity of Helena, to find the probahle cost of erection of a first-class smelter, and to generally interview merchants and mining men on the subject.

A large party of citizens from Central City and Georgetown, N. M., is now searching on the east side of the Mogollon range for the Adams diggings. Seldom a year has passed but what parties have left in search ot these fahulously rich diggings.

HOW FUTURE FORTUNES ARE TO BE MADE.—More money will he made in mining during the years to come than has heen made up to ths present date. The manner of making it, however, will he vastly diffsrsnt. The great fortunes so far acquired have resulted largely from fortunate sales rather than from the profits of mining and shipping ore. Lucky strikss and extremely rich showings have enabled owners to sell for millions where thousands only have heen realized hy careful work and systematic development. To such an extent has this heen the expsrience regarding even our most celebrated mines that it has come to be understood among capitalists that the price of mines are usually placed altogether too high, and that when a man talks ahout millions it is best to let him have time to cool down. It is safe to assert that there are few mines in Colorado actually worth a million dollars, and that those few are yearly decreasing in number. No propsrty is worth so much money unless it is an annual shipper of nearly half a million dollars' worth of ore, and in addition has such vast reserves as to guarantse a certainty of equally large shipments for years to come. The owners of mines which produce so largely cannot afford to sell for what they are really worth, nor can the buyer afford to pay the figures asked for them. Sales are and will hs confined almost exclusively to smaller properties at reasonable figures. The money will be made hereafter, not from sales so much as from ths profits upon ore taken out, and consequently fortunes will be accumulated more slowly. They will come, however, more certainly than heretofore, and will bc as magnificent as any produced by the great industry in the years that have gone by. The man has a fine business and is in the way to acquire a fortune who is making $10,000 per year. It would be a poor mine indeed which does not net its several ownsrs larger profits than this. It takes capital to carry on a profitahle business of any kind; we will wager that it would take no more money to carry on the working of a mine which would net its owners $10,000 each, than a business enterprise of any other kind which would produce like profits. There is money in mining for the men who are willing to make it comparatively slowly, and with as great lahor of hrain and muscle as thsy would expect to exercise elsewhere.—*Rocky Mountain Mining Review.*

MINE GAS..—The quantity of gas which escapes from the faces of work in fiery mines in one year is amazing. A German mining engineer has heen making some measursments and calculations relatively to this emission of firedamp in mines not subject to blowers. He estimates that from the Nieu Isehohn Collisry there is given off annually ahout 320,000,000 cuhic fes t of carhuretted hydrogen; and that tho seven most fiery mines of Westphalia yield in the aggregate an annual quantity of not less than 1,380,000,000 cuhic feet. This is an enormous quantity of a useful gas to throw wastefully away into the atmosphere. If it could be conveniently collected it would furnish fusl in the most economical form, and would hecome a profitahle product of the mines. The time may yet come when this gas will be made availahle.

UTILIZING WASTE HOOP IRON.—A msthod of utilizing waste hoop iron hy forming it into hands for hunching shingles has heen patented by W. E. Harris, of St. Louis, Mo. The waste hoop iron is heated and then passed hetween ths working edges of a lower plain and an upper flanged roller. These rollers rsduces the metal to the proper thickness, while the flanges on the upper roller cut it to the required width. Pins or projections on one roller entering recesses in the other roller perforate the strip near each end. The strip is cut off hy a transverse knife on one of the rollers. The claim of the patent covers the method of utilizing waste scrap iron, which consists in passing it in a hot condition through rolls to reduce its thickness and width also to perforate it and cut it to the required length.

THIS IS THE WAY SOME ONE PUTS IT.—One of our exchanges says the English lion and Russian hear have postponed the fight for the property of another nation, in which they seemed ahout to engage recently, and aro now trying to get the hetter of each other through diplomacy (that is, raising a big smoke, under cover of which each hopes to beat the other in grabhing goods neither has any right to lay hands on).

THE GREATEST DRAWBACK to the use of natural gas is the fact that it is inodorous. Hence if there is any leakage, it may accumulate to a dangerous explosive extent hefore the leakage becomes known. It is from this peculiarity that the many destructive accidents have happened. To remedy this it is proposed to odorize it. Experiments to this end are now in progress in Pittsburg.

THE Virginia *Chronicle* says it is estimated that there are 3,800,000 tons of tailings in Storey county that will assay $4.50 per ton, representing a total value of $17,000,000. If these tailings were close to the Truckee river they could he worked at a profit hy running them through large pan mills run hy water-power.

LEACHING says the Pioche *Record* is pretty much all the go in that vicinity. Some claim to do pretty well, but we are of the opinion that no person is rapidly hecoming wealthy at the business.

ENGINEERING NOTES.

PROPOSED TUNNEL FROM THE CANADIAN MAIN LAND TO PRINCE EDWARD'S ISLE.—As one of the terms upon which Prince Edward's Island entered the Dominion, the Canadian government were to keep up a continuous steam communication between mainland and island, water and summer. This part of the union the government has failed to carry out, and the British government has been appealed to. Senator Howland believes he has solved the difficulty, and has submitted to the Senate plans and profiles of a scheme by which steam communication may be carried on all the year round by a system of tunneling such as now runs under the Clyde, Severn and Thames, and which has been favorably reported upon by Vernon Smith, C. E., well known in engineering circles in America and Great Britain. The total distance from Cape Tormentine to Cape Traverse, the two terminal points, is eight and a half miles. Between these two points are the Straits of Northumberland. It is proposed to run a tunnel composed of metal cylinders three-eighths inches thick, 15 feet in diameter, lined with concrete two and a half feet thick, giving a clear passage way of 10 feet, through which cars may be drawn by fireless engines; also to run piers out from the mainland on the New Brunswick side 10,000 feet, and from Prince Edward's side 4,000 feet. To reach the bottom of the straits, which at the ends of these piers is 20 feet below water level, a cylinder will run down a gradual incline. Ventilation will be secured from a shaft sunk about half way across the straits, at which point the water is 90 feet deep.

RAILWAY PROGRESS IN THE AFRICAN DESERT.—The *Times* correspondent in the Soudan telegraphs as follows: "The construction of the railway is a curious and interesting sight. In advance is a picket of cavalry, while far off on either side the vedettes scout in the bush. At the immediate head of the line is a battalion of infantry echeloned, and advancing as the rails are laid. Streams of coolies carry the sleepers from the trucks, and teams of four artillery horses drag up the rails, two at a time, to the navvies, who lay them in a twinkling, and drive the spikes. In the rear are gangs who complete the line, and further back the ballasting parties."

THE PANAMA CANAL.—A newspaper correspondent at Colon says, respecting the Panama Canal: "The greatest difficulties of construction have not as yet been grappled with at all. At Culebra the summit, where a cut 260 feet deep will be made to tide water level, only about 15 feet have been excavated. The great dam which it is proposed to build between the hills of Obispo and Santa Cruz to control the waters of the Chagres has not been begun, nor has spade been put to all those sluices and channels which are to be built to carry off the waters of the turbulent river in the rainy season."

A CONCRETE BRIDGE ERECTED IN A SINGLE DAY.—The contractors for a canal in Germany, having occasion to cross a much-traveled highway, after completing the waterway, constructed a concrete bridge over the same in one day. The span was 39 feet, and total weight between abutments 194 tons. The work between the abutments was done between 6 A. M. and 6 P. M., by 65 men.

WONDERFUL ENGINEERING PROJECT.—One of the boldest engineering projects yet proposed is that of throwing a bridge over the Straits of Messina that separate Sicily from Italy. A place where the channel is two and one-half miles wide and 361 feet deep is selected. Two piers will support a viaduct of steel rails to a hight of 328 feet above the water.

A NICELY BALANCED BRIDGE.—Every part of the North-side bridge, Pittsburg, is so nicely adjusted that a few days ago one man with a 15-inch wrench raised the whole structure over an inch. The strains put upon it cause it to sag now that it is new, and the application of the wrench to raise it to its correct position is necessary every few days.

THE AFRICAN INLAND SEA.—French engineers are about to begin further surveys in relation to the proposed African inland sea, with the twofold view of constructing a barbor at the mouth of the Oued Mellah, and of ascertaining the feasibility of sinking artesian wells along the proposed line of the canal.

ENGINEERING SKILL in China has achieved a notable triumph in the bridge at Lagang, over an arm of the China Sea. This structure is five miles long, built entirely of stone, 300 arches 70 feet high, the roadway is 70 feet wide, and the pillars are 75 feet apart.

TO RESTORE COLOR.—It is customary to use ammonia for the purpose of neutralizing acids that have accidentally or otherwise destroyed the color of fabrics. This must be applied immediately or the color is usually imperfectly restored. After careful use, an application of chloroform will bring out the colors as bright as ever. Plush goods and all articles dyed with aniline colors, faded from exposure to light, will look as bright as ever after sponging with chloroform. The commercial chloroform will answer the purpose very well, and is less expensive than the purified.

USEFUL INFORMATION.

A NEW MATCH-MACHINE.—Two Troy men have invented a machine which it is claimed will practically revolutionize match-making. It has been operated to make 54,000 perfect matches in a minute and its capacity is expected to reach 15,000,000,000 in 10 hours. The veneer of pine wood is fed upon a small platform and passed between rollers, which partly cut it crosswise the match. From the rollers the veneer passes over the abrupt edge of a coacave where the splints are caught by a rubber roller separated by the action of the roller and rubbed along over the concave so that all the adhering fiber is removed. Then the splints are carried by a chain from which they are forced into a dipping web or strip of paper. The web containing the splints is then conveyed into a trough wherein by the action of a revolving wheel paraffine is put on the end of each of the splints. When the paraffins is dry by passing through a heated chamber, another wheel revolving in a phosphorus composition applies the composition to the ends of the splints and the webs pass the reels where they remain until dry.

CUTTING THINGS UNDER WATER.—When science was in its infancy, says the *Scientific American*, much of its fact was mixed with nonsense, and some of the nonsense shows a wonderful vitality. A case in point is the recent publication of a nonsense bit that was current at least forty years ago. It is a recipe for cutting glass with shears or scissors. The statement is that sheet glass can be cut with the greatest ease with a pair of scissors if the glass is kept under water and kept in a level position. That there is not a word of truth in it any one may easily prove on a trial, with the result of dulling a pair of shears. There is one cutting process that can be better done under water than out of water; that is, the paring of onions. When pared under water the acrid emanations, so unpleasant to the mucous membrane of eyes and nose, are dissolved or held in the water. But neither the quality of glass nor the power of scissors is changed by immersion in water.

THE LATEST IN EXPLOSIVES.—The latest thing in explosives is blasting paper. Dynamite, it is claimed, is nothing to it, and it can be made at so small a cost that the present condition of the dynamiters' treasury would suffice to furnish enough of it to blow the whole country into "smithereens." It is a patent of a Viennese by the name of Petry, and is now coming into use in excavating for building purposes. It is made of common blotting paper. The paper is coated with a hot mixture composed of seventeen parts of yellow prussiate of potash, seventeen parts of charcoal, thirty-five parts of refined salt, seventy parts of chlorate of potash, and ten parts of wheat starch, added to 1,500 parts of water. The sheets are dipped in the boiling mass and dried. Then they are cut into strips, which are rolled into cartridges, and the article is ready for use.

ZINC AS A SUBSTITUTE FOR LITHOGRAPHIC STONES.—Zinc plates are now being used as a substitute for lithographic stones in some of the largest establishments. Praag has used them for ten years or more, and claims that they are fully equal in any respect to stone. It is much cheaper and more convenient. Mr. Prang says if he had not used them, he would long ago have been obliged to add another building to his already extensive establishment. It is expected that this substitution especially for large plates, will soon cause an important reduction in the price of lithographic stones, which are now very high because of their scarceness.

THE LETTER F.—For centuries the inoffensive letter f—inoffensive, even if it does always begin a fight—has been compelled to go through the world with a crooked back, as if it were obliged to bear the sins of all its fellows. Of late, however, the founders have been making fonts where the f is allowed to stand erect, without an ugly kern on the end of its face. When this is done with all fonts, we can discard the fi, ffi, fl and ffl, gaining room for other logotypes, more frequently used.—*Paper World.*

THE OLDEST LIVING THING.—What is said to be the oldest living thing upon the globe is the cypress of Santa Maria del Tule, in the Mexican State of Oaxaca. This venerable monarch of the forest, still instinct with apparently strong life, probably spans the whole period of written history. It is still growing. Humboldt speaks of it in 1851 as measuring 34 feet in diameter, 146 feet in circumference and 282 feet between the two extremes.

FIXING PENCIL MARKS.—Probably the best and most convenient way of fixing pencil marks is to immerse the paper containing the markings to be preserved in a bath of clear water, then flow or immerse in milk a moment; hang up to dry. This treatment will preserve both the ordinary pencil marks and crayon drawings as well.

WHITE LEAD produced by the Dutch process is said to have a higher specific gravity than that produced by other methods. A description of this process is given in standard works on chemistry. It is the process by which lead is largely produced in this city.

GOOD HEALTH.

The Cholera.

My Experience With It and the Way to Avoid It.

[Written for RURAL PRESS and *Cleveland Leader.*]

Our physicians see the "dark shadow" of the cholera approaching this country. They know the rapidity with which this disease spreads and also the direful results of a visit of so *terrible* a pestilence, and have been sending out warnings from time to time, recommending measures that should be put in practice throughout the country. We have been told hundreds of times that "what is everybody's business is nobody's business," and that explains the practical indifference with which these warnings have been received. The people forget that what is done for the general good of all is also for the good of the individual, and overlook the fact that a wrong to the individual reaches out to the mass and lays a tax less or great upon all. One, dying with the cholera, endangers the life of many. The time is getting short for preparation, and unless each performs the part of one, summer will get here too soon to avoid the danger.

The work to be done is only the work which should be done for the improvement of the general health of the people, whether the cholera comes or not. It is a duty that each should perform a share of at once. It is accorded to us as wisdom, if we possess the requisite sense, to profit by the mistakes and the experiences of others. I know the danger from the cholera, for I have seen it. Turning back the pages time has written o'er for me, I find an experience, which, to adopt the words of Victor Hugo, "is more than opportune. It is imperative I publish it."

My Experience.

It is a very simple tale, yet from it those entirely inexperienced may gather sufficient "light" to avoid much of the danger from this source.

This experience takes me back to the home of my childhood, which was in Brooklyn Center, known as Brooklyn Village, a small town adjoining the city of Cleveland, Ohio, on the south. My parents lived there and I lived with my Uncle Deming and Aunt Mary W. Brainerd, on their farm, two and one-half miles west of the town. Aunt Mary was my mother's sister and had no children. She was known to be an excellent nurse.

The cholera was brought there by Mr. James Sawtell, Sen., an old gentleman who had been on a visit to his daughter in Illinois. Though warned of sickness on the Ohio river, he decided to take the river as far as Cincinnati on his route home. There he took the cholera, and reached home but a few hours before his death. His wife was taken soon after. One of the sons came for my aunt to help them. It was very early in the morning when she called me and gave me directions about the baking and work of the day, and without waiting for breakfast rode away. As I stood and watched her going I knew nothing of the danger she was going into, or of the trouble coming to us. I worked all day as though unseen hands were guiding me. I put he whole house in order, got the meals and had success with the baking. This was in July of 1852, when I was not yet fifteen years old.

On arriving at the house, Aunt Mary went immediately into the sick room and began the battle with death in the form of Asiatic cholera in the worst type. There she with others labored the whole day, the disease gaining on them, and at 5 P. M. hope had failed them, and in the night Mrs. Sawtell died. Only the necessity of immediate action had caused Aunt Mary to enter the sick room with an empty stomach. An hour or two passed before breakfast was announced, but before that, feeling faint, she drank a glass of water she found standing in the sick room, believing it to have been just brought in. She learned, on inquiry soon after, that it had been standing there some time. She knew then that the water might have gathered impurities, and took measures to counteract any bad results that might follow. As the day wore on she became conscious of the fact that she had taken a serious risk, and by 5 o'clock was too sick to stay longer. She reached home about 6 o'clock. Anxious always for the comfort of others, she said: "My child, how did you get along with the work without me to-day?" I replied, "Pretty well, auntie," and then she said, "I am so glad, for *I am sick.*" It was certain she had taken the disease. It gained ground rapidly, and though all was done that we could do, she sank steadily through all the changes of the disease, and died before noon the following day.

I will not try to describe the disease. It has been done repeatedly in a better manner than I could do it. We labored for warmth both inwardly and outwardly, and were compelled to hear her call "hot," the only word she could speak towards the last, and we were unable to get any warmth to take effect. No words can describe the horror of such a death. Among the women who came to lay her out was Mrs. J—— S——, a true friend and neighbor, who gave me the following recipe as a preventive and charged me with true motherly kindness to be very careful in all ways, but if I felt any trouble in my stomach, to take:—

One teaspoonful common salt, one teaspoonful ground black pepper; put them in a teacup, and stir in good cider vinegar until the mixture would pour (some three or four tablespoonfuls), and take a teaspoonful once an hour, as long as any trouble was felt.

I felt no trouble until near midnight, when I got up and compounded the mixture and returned to my room. I took one dose, went to bed and slept until morning. I took another then, and one or two doses a day for three or four days. I had no more trouble.

My aunt died on Thursday. We laid her to rest on Friday morning, not postponing the funeral, as nearly all the friends were badly frightened by the presence of the cholera in the vicinity. Even the physician we called showed fear. I returned with my uncle and tried to make the house home-like. Uncle buried, at a distance from the house, everything soiled in the sick room, which in the light of later knowledge, was a questionable proceeding. He wandered around, in and out of the house, like one bewildered, and seemed to have lost everything desirable in life, even the wish to live. He neglected to use the preventive, and that night was taken down. From the first he felt he should not get well. Three brothers of my aunt were with us; they went to work with energy, but they only postponed the time of his death a few hours. Could make no headway against the hold the disease had upon him. He died Sunday morning.

Saturday morning, my father then a notary public, was called to write a new will. He did not think it right to leave me long exposed to the danger, and so took me home. Thus the house was left without a woman to aid in that fearful struggle with death. But those were competent men for the situation; they used the preventive and were not afraid. The disease ran in different directions until fourteen deaths were counted against it, and then it was subdued. The two sons of Mr. Sawtell, James and Ira, whose homes were in Cleveland, both died. Sanitary conditions were comparatively good, and had a knowledge of this preventive been general, there would have been less trouble. It was little known; my aunt knew nothing of it. This preventive seems to kill the fermentation in the stomach at once; it warms and restores the natural action of the stomach, and is followed by no unpleasant conditions. It is also a remedy that one is not likely to take an over dose of, though when in need of it, so far as I know, no one ever objected to take it.

I have never seen the cholera since that time, yet I have used this recipe nearly every summer in my family since it was given to me, to restore the healthy action of the stomach, and in cases of cholera morbus it works like a charm. It has never failed once to give immediate relief. The youngest case of cholera morbus was our little daughter, then eight years old. She was taken in the night very severely. I gave a half teaspoonful of the mixture, and in half an hour another, at the end of the hour another, and left her soon after asleep. In the morning gave hot milk and dressed her warmly.

The whole array of so-called summer complaints are cold diseases, and need especial care in dress. I have been careful in giving names, place and time, for the reason that there are many living in that vicinity who will remember the excitement caused by the facts I have related.

I have read the article in the March number of the *Century Magazine*, "An Unwelcome Guest." I venture the opinion and think the facts will support it that cholera is not a disease of the nerves. Our physical organisms are worked by the nervous system on very much the same principle that railroads are run by telegraph. The nerves are busy in sending in reports of the progress of the disease, but the seat of the trouble is not in them. Fear paralyzes the action of the nerves to a greater or less extent, and places the person so affected in greater danger. Its action is like opening the gates of a besieged city and inviting the enemy in. Exhaustion of the nervous force, from any cause, is alike dangerous. Indifference as to whether one lives or not places an almost insurmountable obstacle in the way of recovery. Anything that reduces the resisting force of the body against disease, anything that tends to injure the general health, is a source of danger—and therefore sanitary measures are a necessity.

Before closing this article, I wish to recommend an arrangement I have seen in practice on a farm near here, to take the place of the condemned privy vault.

To a large drawer some 15 inches deep, made water-tight on the bottom, are attached runners like those of a sled or small rollers. This is well lined with dry soil and pushed into place from the back of the privy. The contents are kept covered at all times with dry soil, wood-ashes or lime to absorb the odors.

As often as necessary, the horses are hitched to coupling irons on the back edge of the drawer and it is taken to the manure pit and emptied, the contents mixed with muck, to be afterward used on land intended for corn. The drawer is relined and replaced. This arrangement permits of no waste and preserves pure both air and water.

MRS. M. P. CUNNINGHAM.

Clyde, Sandusky Co., O.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SOUTH SPRING HILL.—Amador *Ledger*, June 10: This mine continues to develop in a satisfactory manner. The ore bodies in places are 20 feet wide—plenty of ore to keep a 20-stamp mill constantly going. The new hoisting machinery is working like a charm. The contractors for sinking the shaft 100 feet deeper have got through 70 feet, and expect to get through with the job in about two weeks, when a new level at the depth of 700 feet will at once be opened up.

SUTTER CREEK.—The water is once more out of the Mahoney mine. As soon as this was accomplished W. A. Nevills and Captain Nichols came over, and went all through, making a thorough exploration of the lower levels. This took about half a day. They have gone below to report to the parties who are thinking of purchasing. Before leaving they informed us that it would be a week before anything definite concerning the success or failure of the negotiations would be known. A portion of the Eureka mill will be started in a few days on rock from the Median mine, near Amador City. The crushing will consist of about 100 tons, intended to test the milling quality of the ore. A part of the Mahoney mill has been started on rock from the Wabash. The ore seems to be of good quality, and is expected to turn out handsomely.

Butte.

SPRING VALLEY.—Oroville *Mercury*, June 8: Cherokee is booming. A trip to that famous mining camp on Sunday convinces us the mine there, and smaller ones in that vicinity, are giving promise of richer yields in future than ever before. In company with Superintendent L. Glass, J. Roger and Will Herrin, we visited the mine. There is a gigantic project on foot at present to mine out an immense bed of gravel by the drift process. A shaft 130 feet deep has been sunk on the west side of the mine, and a tunnel is being run from the bottom of this shaft under the great mountain on the west where is an inexhaustible deposit of rich gravel. The reason of this resort to drifting is, that it can be mined by that project much cheaper and easier than by washing the great bed of pipe clay and non-paying earth by the hydraulic process. The tunnel is now about 600 feet, and will be run about 1,600 feet further. Mr. Glass is confident of making a big haul when the gravel deposit is reached. Ingersoll drills are being used in excavating the tunnel, and they make about five feet per day. There are 215 men employed by this mine, and their pay roll is simply immense. There are 3,500 inches of water running into this mine through hydraulic pipes, and an average of sixty million gallons passes through its miles of flumes every twenty-four hours. It is without doubt the best regulated and most gigantic hydraulic mine on earth. Louis Glass is general superintendent and John Tuhey is foreman. This mine supports a population of eight or nine hundred. There are in the town four hotels, two well stocked stores, three saloons, livery stables, shoe and blacksmith shops. It is probable that the number of employes in the mine will reach 500 in the fall if the drifting scheme is what the company anticipates. The amount of work done, the money expended, and the general immensity of this mine, is inconceivable unless a person visits and is shown through the mine.

Fresno.

MINING INTERESTS.—Union *Democrat*, June 13: The mining interests of this county are at a standstill at present, but the future is full of promise. The Volcano mine, owned by Thomas Hildreth who formerly lived in Tuolumne, is opened to a depth of 200 feet, and the shaft is still being sunk into a body of very rich ore. The stopes will be started as soon as the shaft is 50 feet deeper. The mine is located in a granite formation. The Abbey, more commonly known as the Morrow mine, has recently changed hands and is now owned by a San Francisco company who have gone to work in a business-like manner. They have a tunnel over 150 feet in on the vein, which averages 18 inches of rock that shows gold. They are sinking a shaft to tap the vein at a depth of 250 feet. Hoisting works are being put up, and in due time a 10-stamp mill will be erected. This has the appearance of being a lively camp this fall. A large store is being put up by San Francisco men, who intend carrying a stock sufficient to supply all the wants of a mining camp. Last Saturday came the final stroke of fate to the short lived Quartz Mountain mine, 12 miles from here. All the miners were ordered to the office for their pay. They were then knocked off, and the works shut down. Hearing of the "burst up," I went over to see what I could see. I will give you a rough description of the scene of extravagance and mismanagement the place presented, a story only too well known to those familiar with the ups and downs of quartz mining in Tuolumne county. The residence of the president of the ill-fated company is the most prominent object about the embryo city. It is a beautiful frame building, handsomely adorned with large bay windows all round, and is furnished in a most luxurious style—Brussels carpets, elegant French walnut furniture, frescoed ceilings, all to the extent of $30,000. To the north of the village stands idle the 60-stamp mill, one of the grandest structures to crush quartz in an extravagant mind ever contrived. It is supplied with modern pans, settlers, splendid steel boilers and costly double cylinder engine—and no gold in the rock. The ditch that was started last summer, and half a million dollars spent on it, has never been completed. Everything lying in idleness tells the old, old story of wasteful and useless expenditure of money before it was known whether there was a mine there or not. Flashy superintendents, fine horses and champagne are true signs of poor financiering in mine management, and Quartz Mountain furnishes a brilliant example of magnificent failure.

Inyo.

WHITE HILL.—Inyo *Independent*, June 13: Two very promising new locations have recently been made south of the White Hill mine. One of these is called the Bald Hill, and was located by Dan Hock, Wells Barnes and Pat Keys. The ledge is two feet wide, and the ore is of excellent quality. Not much work has yet been done on this claim, as the owners are busy with other work. One of the partners working alone has taken out in 10 days seven tons of ore that will net $80 per ton. A region where the labor of one man can produce $560 in 10 days surely offers inducement for prospecting.

WHITE HILL MINE.—From the White Hill mine a large lot of ore is now ready for shipment. This ore will net the owners handsome returns. Here again is another instance of what may be done in the Inyo mountains by practical miners working their own claims. Alexander, Kehoe & Barnes are all working men, they are developing their own property, working as pleases themselves and surely $400 per month is very nice pay for very honest miners, as the worthy owners of the White Hill are. The mine is now looking very well.

WELCH AND DOWNS.—These parties have one of the best claims yet found on the hill; their ledge is five feet wide of nearly solid galena. The mine is in course of being opened up, and improves with each day's work. They are getting out ore right along, and will soon make a shipment.

MINETTA.—Is the name of a claim adjoining Welch and Downs on the south, and is owned by Eldred, Crough and Hedge. The ore is a fine quality of galena, carrying about 65 per cent of lead, and about 70 ounces silver per ton. Very fine specimens of galena crystals are brought into town every few days from the Minetta.

NEW TRAIL.—The owners of the two last named claims have begun work on a new trail, from Union Spring near the foot of Inyo mountains up to their mines. A good trail with but few turns can easily be made.

Mariposa.

TALC VEIN.—Mariposa *Herald*, June 12: The talc vein out at Sherlocks seems to be the center of mining excitement at this time. It is on this lode that the mines of Geo. Lacy and French Pete are located, than which there are none better in this section of country. Several gentlemen from Mariposa have recently located claims, viz: Manuel Davanay, M. M. Rumley, James A. Ridgway, Wilke Green, District-Attorney Jones, Henry Miller and others.

Mono.

SILVER KING MINE.—Inyo *Register*, June 13: This mine, situated in White Peak mining district, Mono county, promises to be one of the valuable and paying mines of the White or Inyo range. It was discovered last February by a Piute, Sam Witherill, also the discoverer of the Indian Queen, and by him shown to its present owner, Hugh Jones, ex-Superintendent of the Queen mine. The vein is four feet in width; average assay value over $100. Mr. Jones is now prospecting the vein by running a tunnel to cut it a depth of 80 feet. An incline on the last fifteen feet shows improvement all the way in the ore. There are several tons of ore on the dump that will mill at least $100.

THE HIGH SIERRAS.—Thos. Agnew, a widely known mining man and old prospector, passed through here from Benton on Tuesday, bound for the scene of his annual summer's labors up here on the extreme head waters of the San Joaquin, in what is known as North Fork district. It is about seven miles west of Mammoth, just over the divide in the comparatively low pass at the head of what is erroneously called the North Fork of the San Joaquin, it being in fact the main stream. Every summer for eight years Mr. Agnew has delved away there, ever firm, as he is to-day, that he has a ledge of sulphide of silver ores really as valuable as any in all this State, or perhaps, any other. As described to us, there are five parallel ledges, all within a mile strip, in a slate formation, traceable for miles, and all yielding rich ores in every place wherever they have been opened, as each has in a number of different places, as at times, seventy or eighty men have put in a summer on them. It is considered an extension of the Mammoth belt, but instead of gold, it is silver ore exclusively. The largest ledge is 200 feet wide, and tunneling into and crosscutting this has been Mr. Agnew's work for several seasons. He has cut into the ledge 30 feet, and affirms that the average value shown by a score or more of assays of pulp from drill holes was not less than $140 per ton. He has about forty tons of ore on this dump,

San Bernardino.

THE BONANZA KING.—Calico *Print* June 14: The mill of the Bonanza King Con. Co. of Providence is being improved and put in good running order and will start up again in a short time. A full force of men will be engaged in the mine as soon as the requisite number of good miners can be obtained. The Bonanza King mine has made a fine record in the past year, yielding on an average of $60,000 per month, and the present indications of the mine warrant the expectation that even a greater yield will be obtained in the future. This company have advertised for thirty-five men more to work in the mine, which will increase their force to about ninety. Under the general management of Mr. Kelley the operations of the mine and mill are being conducted in a most systematic and profitable manner. Other properties in this vicinity, by persistent development, are coming to the front and attracting considerable attention, so that we can confidently expect that Providence will become a large, substantial and flourishing camp in the near future.

MINERS WANTED.—Since May last the work of putting the mill in shape has been pushed ahead as fast as possible. Caldwell's big ore team is running constantly between the mine and mill and the ore house is being filled up. Men are arriving to work at the mill and as soon as everything is in place it will start up again. The ore bodies in the mine justifies a person to predict that the mill will not shut down again for at least eighteen months. The quality of ore at the lowest depth (8th level) shows to be as good as it was in the upper levels. Good miners are being put on as fast as they arrive and the Genl' Manager told me to-day that they want 30 or 40 miners at once. Kerr & Patton are taking out ore for shipping. Dwyer & Gorman are also assorting up ore as fast as they take it out for the purpose of sending to the mill. Cook & Thompson of the Mozart group have about 100 tons of ore ready for milling. The mines of the camp never looked better and the Bonanza King's showing on the lowest levels gives every guarantee of permanency. McFarlane & Barrett are to start the Ivanpah mill on their Mescal mine on or about the 10th.

Shasta.

MILL.—Shasta county *Democrat*, June 13: Ed. Reid returned last Sunday evening from his trip. He purchased his quartz mill and other machinery at the Marysville foundry. The mill apparatus will be shipped and erected at the mine as soon as possible. Low & More, prospectors, last week made another rich strike on Squaw creek within a few hundred yards of the Whitton & Small mine. Assays of the rock made by Ellis of the Windy Camp silver mines run as high as $500 per ton. A few days ago Ebersol, Luce & Co., struck very high grade ore on the second extension north of the Mammoth mine near Churntown, Buckeye district. It is claimed that specimens of the rock excel anything yet found in a fissure vein in that district. Thos. Derby, who bonded Whitton & Small's mine on Squaw creek, accompanied by S. B. Christy, of the State University, passed up on last Saturday's train to the mines.

RICH.—Heretofore we have made mention of the discovery of rich gold quartz by Peter Schearer and Geo. Rattler, on Salt creek, on the former's patented land. When the strike was first made it created considerable excitement in town. They sunk a shaft about 18 feet deep, took out considerable gold, and then ceased work for awhile. About a week ago work was commenced again. Last Wednesday the pay increased, they taking out on that day $200 in one pan. Since, the pay has been getting better, and Mr. Schearer, who is no miner, informed us that he has taken out chunks of solid gold as big as a man's hand, one piece weighing over $500. Since Wednesday last we are informed they have panned out over $2000, besides taking out rock that is more or less yellow with gold. Probably it is the richest quartz gold deposit ever discovered in this part of the State. Mr. Schearer says $100,000 will not buy the property. Several old miners have visited it during the past few days and say it is the richest thing they ever seen in all their mining experience. Small nuggets of gold can be cut from the rock with a chisel or knife. At the bottom of the shaft one can see the "yellow truck" sticking to the rock in strings and blotches. This nice "nest egg" is only three miles from Redding.

Sierra.

PIKE CITY MINES.—North San Juan *Times*, June 13: Judge Bishop, of North Bloomfield, a practical geologist who has made quartz mining a study, has been spending some time at Pike City and vicinity prospecting. He has discovered several new ledges, one of which he calls the Crescent. This ledge crosses Plum valley creek or ravine, and is within three-quarters of a mile of the old Plum valley house. This ledge he traced for a distance of half a mile or more. At the point he struck it the ledge is about eight feet in width and nearly solid. The quartz at this point contains large quantities of galena and dark pyrites of iron. It is rich in sulphurets and free gold can be seen in the rock. The walls are talcose slate. The foot-walls and hanging walls are in tale. It dips into the divide or ridge between the Yuba river and Plum valley creek, and can be worked to immense advantage with water power for eight months in the year. Judge Bishop also took a survey of the Philips & Weiss claim at the head of Grizzly canyon, about two miles east of Pike City. He found the quartz in this ledge very rich with gold. The owners have gone into the bowels of the earth 1,500 feet, and how much farther the vein extends is a case of *quien sabe*. The mine is worked by the drifting process, and not more than 25 per cent of the gold is saved. The adjoining claim on the east, owned by Martin Bope, is in the same kind of formation. A half mile west of Philips & Weiss' claim, toward Pike City, the Judge surveyed a quartz mine owned by Thomas Marriott, which he found, as he believes, a first-class vein nearly three feet wide, and containing rich deposits of gold in sulphurets and oxidized iron and galena. He thinks the latter may prove to be a first-class mine. About a fourth of a mile from the latter mine toward Pike City he examined a mine owned by T. Wayman and Mr. Granger, secretary of the Alaska Company. On this ledge a shaft 20 feet deep has been sunk, at which point the mine is four feet in width and gives evidence of being very rich. A fourth of a mile from the latter location is the Grizzly mine owned by a man in New Jersey named Jameson. The mine has been partially developed and found to be rich in auriferous gold. Still closer to the Alaska mine is the Golden Nugget claim, located by John Greenbank. No work of importance has been done on this claim. So far as prospected it shows a two-foot ledge. The ledge will be included in Judge Bishop's lines when the company is formed. Each location is 1,500 feet in length and 600 feet wide. Judge Bishop says the Alaska mine is immensely rich in gold deposits, and it may be called a true fissure vein. It is now worked on a 500-foot level, and improves in richness as depth increases. Thomas Philips has a location on the eastern extension of the Alaska, but it is undeveloped. W. Philips & Co. have also a location east of Thos. Philips, on the same vein. This location is also undeveloped.

THE FLORENCE QUARTZ MINE.—Sierra *Tribune*, June 10: The above mine is situated in "Nigger" canyon, not far from the famous Keystone mine. A new water-wheel has been placed in position at the mill and the stamps will begin crushing next week. A large body of gold bearing quartz is in sight, and it can be mined and milled so cheaply that low grade ore will pay the owners a fair dividend.

Trinity.

NEW RIVER.—Cor. Shasta *Courier*, June 13: Reaching New River we find the place quiet, and on looking around, find that the reason for this is not to be found in the want of paying ledges, but rather in the want of money on the part of those who have made locations. About 600 locations have been made, and out of that number only some half dozen have been developed, consequently there is no work for the many miners who have flocked in there, and many of whom on this account are ready to run the camp down. There is another class also, who are very expert in speaking a bad word for the place; those are men who never earned an honest dollar in their lives, who rush to every new excitement, to prey upon the hard earnings of the miner. So far as New River is concerned, every vein that has been discovered and properly developed, has proved a paying mine. Among the paying and well-defined ledges in the district are the Mary Blaine mine, which works 16 men and has a five stamp mill running night and day. The Uncle Sam which has also a five stamp mill and an arastra attachment. The Hunter mine, also the Ridgeway, are two well developed and paying properties, and the Uncle Sam mill is now running on Ridgeway ore. The Hard Tack is probably one of the best mines in the district, and has an arastra which yields a return of from $6,000 to $9,000 per month with the work of eight men employed in the mine and arastra. The owners, Messrs. Ladd & Clemens, gave a bond on the mine some time ago to parties in San Francisco for $60,000 and the bond will be closed sometime this month, as the mine is far more valuable now than when bonded. If parties who only seem ambitious to vie with each other only in making locations would turn their attention to the development of some of them instead of simply scratching on the surface, New River would to-day present a far different appearance. But just as long as a few men are allowed to locate the whole country, in order to sell out a few holes in the ground, just so long will the district be held back in development. However, taking the country in between Virgin creek, on the Humboldt side of New River, and coming through the mountains to Shasta, the experienced miner cannot help but proclaim that mining is but in its infancy, when he beholds the numerous quartz ledges that cut the country in a northeast and southwest direction, and when the same energy is displayed in working ledges, that has been displayed in placer diggings, enough wealth will be taken from the immense ledges to again astonish the world with the extraordinary production of the precious metal found in Old California.

DEADWOOD.—Cor. Trinity *Journal*, June 13: I will say that the mines in operation are doing well and yielding bullion as favorable as ever. Those mines bonded by Shattuck and Wm. T. St. Auburn are standing the test very well. Mr. Thos. Simons, superintendent of the Shattuck mines gives very favorable reports and feels confident of opening a large and valuable property. Wm. T. St. Auburn is doing active work, running two shafts and extracting good bodies of paying ore. The Blakemore mine, on Jennings gulch, is also in active operation, and we are in hopes of soon hearing favorable reports from that section. As regards recent discoveries there has been a few during the past week, one by Banks & Clements, on Thorn gulch, which is about two feet between walls and prospects fair; O. J. Collopy is a partner in the new discovery. Another prospect has been struck lower down on the main creek which looks very promising. Other prospects have been found, but little or no information can be obtained as regards their richness and size.

Ventura.

ANTIMONY.—Ventura *Free Press*, June 10: "The antimony mines, situated about 60 miles from Ventura, in Ventura county, are being worked at the present time with considerable success. They are on the north slope of the San Emigdio mountain, five miles from the summit. Our informant who has just visited the spot, says a mill is in the course of construction and will soon be in working order. The mill is located in San Emigdio canyon and about two miles from the mines. The trail is steep and zigzag, but when reached there seems to be a mountain of ore represented by short tunnels at different levels and showing ore everywhere. In some parts of the mine the ore assays 150 ounces of silver per tonr About this mine hangs a mystery that nothing but the future can reveal. It has been rumored for many years that somewhere in the San Emigdio mountains is an old mine worked by the Mission fathers, but its whereabouts has been so completely concealed that it has never been rediscovered. A Santa Barbara gentleman told our informant that a relative of his as far back as 1854 went into the mountains with a party of men, accompanied by an old Indian who was to take them to the lost mine, which was reported to be very rich, but after many adventures the search proved a failure. It is not unlikely that this antimony mine was worked by the early fathers." This mine is now owned and is being worked by a company of which Chaffey Brothers of Ontario are the leading spirits. Geo. Chaffey is superintending the mill property and getting it ready for work. The company we learn has a contract at a good paying figure for all the antimony they can take out to be shipped to England.

NEVADA.

Washoe District.

HALE AND NORCROSS.—Virginia *Enterprise*, June 13: The flow of water which came in from the east side of the main north lateral drift on the 3,000 level Wednesday night still continues. It is near the face of the drift, 150 feet from the Savage north line, and opposite cross-cut No. 4. This portion of the drift has been comparatively dry heretofore, but the formation on the east side being of the clay and porphyry order, and becoming saturated with water from the recent pump flooding as well as from the water following the strata from the level above, it gradually swelled and pressed inward. The flow of water is between two and three inches, but as it comes from the 2,900 level, from whence it has flowed heretofore, there is no real increase of water for the pumps to handle, and no trouble whatever is experienced from that source. Meanwhile the timbering has had to be braced and thoroughly secured, and it is not deemed advisable to advance the explorations any further in that direction at present. In fact this north lateral drift has been found too far to the east of the ore vein—about 45 ft.—and was recently turned more to the westward in order to skirt diagonally into the ore vein. The face of cross-cut No. 4 west from it was showing good streaks and spots of fine ore at the time this trouble cut off the work. Archie Borland says it is the intention, however, as soon as practicable, to resume explorations both north and west at the interesting point. Meanwhile, in order to guard against and provide for any additional water emergencies, the management have given orders and contract for an addition or other half to the big hydraulic pump in the Combination shaft. This will double its capacity, and make it able to pump a stream from the lower levels as large as Carson river. It will take a few weeks to get their new pump column in, but when this is done the present one, which bursted and gave so much trouble recently, can be repaired or renewed with the greatest facility, and without interruption to the

regular drainage of the lower levels. From cross-cut No. 2 the lateral drift south is out about 25 feet, in good milling ore, leaving about 80 feet to connect with the drift coming north from cross-cut No. 1. Ore from the openings on the 3,000 level continues to be hoisted as occasion offers, and quite a large accumulation of it is on the dump. The winze to be sunk in the ore body below the 3,000 level will be from the north lateral drift in cross-cut No. 2.

CON. CALIFORNIA AND VIRGINIA.—The regular weekly yield of ore from the 1,750 level, on company account, is about 750 tons. It is all from the old bonanza stopes and workings, and the average assays for the past week were $17.50 per ton. This ore is all shipped to the Morgan mill for reduction. Cross-cut No. 3 on this level is being advanced at the rate of about 25 feet a week. On the 1,700 level the main north lateral drift is being extended in good working ground. From the Jones lease section, the upper bonanza workings, over 1,000 tons a week are being extracted, but the average grade is rather low, the assays during the past week averaging $10 per ton. This ore is shipped to the Eureka mill, on Carson river, for reduction.

BALTIMORE CON.—Only enough ore was raised for a test of the new furnace last week. It succeeded very well, but better success is expected from the next run, which will be made shortly. The tributers working on the 226 and 450 levels are still extracting and accumulating high grade ore from the small narrow vein.

CHOLLAR.—Good progress continues to be made advancing the main lateral drift southward on the 3,000 level, and cross-cut No. 3 shows good vein formation in its face with occasional spots of ore-bearing quartz.

MEXICAN.—On the 500 level the joint Mexican and Union drift, running north, is being steadily advanced, and a drain is being cut to carry off the surplus water. The west cross-cut is also making good progress.

BEST AND BELCHER.—The joint east drift with the Gould and Curry, on the 1,000 level, is being advanced at the rate of about 60 feet a week, in good working ground. It is now out about 200 feet from the main lateral drift.

OPHIR.—The upraise above the 500 level, to connect with and drain the old Mexican shaft, is making about 15 feet a week of upward progress, the work necessarily being slow and carefully conducted.

BULLION.—Water interferes with the work on the 160 level, but the west drift makes continued advancement, and has passed into very favorable looking vein porphyry and quartz.

CROWN POINT.—The old upper levels of this mine, and also the Belcher and Kentuck, continue yielding large amounts of low grade ore, being the leavings of former bonanza days.

ALTA.—The upraise above the 950 level is being continued, and good little bunches of ore are found in the explorations, which are taken out for milling.

OVERMAN.—About 25 or 30 tons a day are being extracted from the 226 level and the incline below, which is shipped to the Vivian mill.

YELLOW JACKET.—The old stopes and chambers from the 1,200 level up are still yielding and holding out well as usual.

WOODVILLE.—About 10 tons a day of good pay ore are being extracted from the 400 level.

Columbus District.

MOUNT DIABLO.—Candelaria *True Fissure*, June 13: The west drift on the sixth level has advanced 20 feet during the week, and the east drift on this level has been driven 10 feet. The east drift on the fifth level is in 145 feet and shows ledge matter giving low assays. The stope above the west drift on the fifth level is giving some good ore and looks promising. The intermediate stope, between the fourth and fifth levels, looks well. The west drift on the fourth level is giving some $30 ore from a small streak. The west drift on the third level is turning out considerable ore of good grade. Some ore of fair grade is being stoped from winze No. 5, below the third level, and also from the intermediate, between the second and third levels, east of the shaft. The second level is yielding some high grade ore, from a small streak. The intermediates, between the first and second levels, show an improvement and are giving some high grade ore. The west drift on the first level is yielding a little low grade ore, and the east drift on the same level is giving some high grade ore from a narrow streak. A bullion shipment of $14,884.40 was made on the 8th instant.

Eureka District.

PROSPECT MOUNTAIN.—Eureka *Sentinel*, June 10: The Alexandria and El Dorado mines below it on the hill are being worked on tribute. A shipment of nearly fifty tons was made from the former last week, and at the latter there is a good pile of ore on the dump, ready to be shipped to the furnaces. I next went to the Lord Byron mine, which has paid so well lately after a rest of twelve years. Seeing no ore on top, I moved on to the Morris and Whippoorwill mines, the property of Joe Dejoe. Here the country looks hard and hungry enough on top, but the dump is covered with ore. The country around here has been sounding the praise of Joe's mine on account of the discovery of a system of caves, which contain no end of ore. Joe had gone to town to spend the Sunday; hence, I had to forego the pleasure of seeing this new wonder. A little higher up the mountain and to the northward is a tunnel and dump, but there being no one around I could not learn the name of it. However, I saw the best evidences of a prospector's prosperity, viz: Two hundred sacks of ore, and from 2 to 15 tons ready to be sacked. This appeared to be of very good quality. In this locality there is a remarkable growth of fine timber, consisting of oak and pine, which puts it in a pleasant contrast with the bare and barren hills surrounding it. I made a hasty call on Martin Piantoni at the Dead Broke mine. He is taking out some splendid carbonate of lead ore, of which there is a very large quantity in sight. Martin says there was a party looking after a lease of the Lizzie L. mine, and thinks they can make money if they get it. The Williams mine is looking well, and John McNaughton is commencing to ship about 100 tons of ore from there to the Richmond furnaces. The ore from this mine is usually of good quality. This much is plain to an observer: There is a strong evidence of growing and increasing prosperity on Prospect Mountain, which is apparently due to the number of miners who are leasing claims. In some cases 20 per cent is paid to the owners, but in most instances the owners provide supplies and receive a higher percentage of the ore.

ORE PRODUCERS.—Eureka *Sentinel*, June 13: The ore shipments from mines in various parts of the district to the two reduction works in town during the past week have been numerous and in some cases unusually large. The Jackson mine on Prospect mountain sent down to the Eureka Con. works 18½ tons of ore, and the Hamburg, a neighboring property which is looking very well, shipped to the Richmond works 12 tons. The Bowman mine on Adams Hill shipped to the last named furnaces 25 tons, and the Idaho on the north spur of the same hill made a shipment of 10 tons. The Frazier & Molino shipped 9 tons to the Eureka Con. furnace, and the Ohio made a fair size shipment. To the Richmond works the Lord Byron shipped 12 tons, the Dunderberg 17 and the Eldorado 6. The Marguerita shipped to the Eureka Con. furnace 5 tons, and the Eureka Star sent down to the Richmond works quite a lot of good ore. Shipments were also made to the last named works by the Queen mine, the Uncle Sam and the Maryland. Tom Kinney shipped in to the Eureka Con. works from one of his properties near Hamilton 4½ tons, and from the Reveille district, Nye county, over 80 tons of rich ore was sent in. The Silver Connor mine, on Prospect mountain continues to look splendidly, and the ore yield from it during the coming summer months will fully equal if not excel those of last summer. It paid to its owners last month a dividend of $1,000. The Silver Lick, on Adams Hill, is also looking and yielding well, and the probabilities are its owners will soon know what it is to receive good sized dividends.

ARIZONA.

CLIFTON.—*Clarion*, June 10: Messrs. McCrellis and Johnson, who contracted to get out ore on the "7-30" a short while back, were compelled to give it up on account of the flow of water running in. The Copper King, which is in the Metcalf group, is worked by contract by Messrs. Murphy and Mike Shea. They are getting out about eighteen tons of copper ore daily, and have six men in their employ. The machinery at the head of the Longfellow incline has been undergoing repairs. The incline tunnel is in 80 feet. It is going to be drove down to the 500-foot level, and a skip is to be run in it when completed. Parker and Whalen's outfit are at the Garfield. Prospectors have left the mountains, and developments of claims have stopped since the outbreak. Thus things will remain until a sense of security is felt, or, at least, a more settled state of affairs. Work on the Alaska, El Paso, Tip-Top, Vanderbilt, Commercial, Morning Star and Ady Blum has been suspended, the boys deeming it not prudent to undertake to work and watch at the same time for Indians. This step was taken on receipt of a copy of Gen. Crook's cautionary telegram.

COLORADO.

VARIOUS DISTRICTS.—Colorado *Miner*, June 13: During a business trip last week we passed through the following mining districts: Banner, Trail Run, Downieville, Montana and the northern end of Griffith, and is gratifying to report the prosperous outlook in all the camps we visited, with the exception of Banner district, which seems in a dormant state at present, but the prospect of a revival of work on an extensive scale is promised. Trail Run is fast coming to the front. The smelter there is running day and night, and is unable to keep up with the demands made upon it. Downieville and Montana districts are shipping large quantities of ore monthly, all of a high grade. The lodes surrounding Dumont are looking better than ever. The citizens of that camp are in high glee over their brilliant prospects. But Griffith district still leads the van. The amount of ore produced in all these districts, if it was possible to report it, would astonish the outside world. Never in the history of this county has the output been so large as at present. The Johnson lode, in Argentine district, is still producing her usual quota. Comstock & Co., contractors on No. 4 level, have exposed a vein of sulphuret ore from two to six inches thick. A good shipment will be made in about ten days. Johnson and Peterson, lessees on No. 5 level, have a vein of the same kind of ore, ranging from 2 to 8 inches in thickness. They will also make a good shipment shortly. The Morgan lode, in Trail Run district, is owned by Morgan, Brooks and Williams, who have sunk a shaft upon their claim to a depth of 30 feet, which shows a vein of auriferous quartz 3 feet in thickness, which mills 13 ounces gold and 157 ounces silver to the ton for first-class, and $98 for second-class. The Gypsey is the west extension, and is owned by the same parties, who have merely made a discovery upon the claim, which looks very promising. Keith & Co., owners of the Keith tunnel and group of lodes on Keith mountain, on Mill Creek, contemplate putting in an Ingersol drill, to be run by water-power, and bids for a contract to build a flume are now being taken. We would like to see this tunnel driven ahead, as from our knowledge of the country, we feel perfectly confident that it would open up some valuable claims. The Pelican-Dives mine, on Republican mountain, produced and shipped 46 tons of ore last month, the largest monthly shipment since 1883. Fifty-eight men are now employed on this claim. The output is increasing every month, and before long we hope to see this old property once more in the lead. The Old Bluff lode is a new discovery by McDonald and Reed, in Trail Run. They had a test made of some of the surface quartz which gave $18.90 gold to the ton. With depth this claim will undoubtedly prove a good producer. The discovery now shows a vein of quartz 12 inches in thickness. The Old Settler lode, in Trail Run district, will be worked again soon. An engine is to be erected at the shaft in place of the whim which has been in use. This is unquestionably one of the finest pieces of gold property in the State, and the present owners are to be congratulated upon their apparent bonanzas. The new pump has arrived, and is now in working order at the Albro mine at Dumont. The old Albro is one of the main veins of this county, and now that everything has been arranged, the work at sinking on the shaft will, in all probability, be commenced within a few days.

IDAHO.

THE SMOKY DISTRICTS.—Wood River *Times*, June 10: W. H. Watt returned to-day from a trip to the Smoky districts. He reports a large number of prospects there looking very promising, while the mines are looking better than ever. The Carrie Leonard makes a really fine showing. The vein is eight to twelve inches wide, of high grade ore carrying gray copper. All the openings show ore. The owners are preparing to ship to Ketchum, owing to the absence of a wagon-road to Hailey; but to do this they will be compelled to pack 15 miles to the wagon-road on Warm Springs Creek. McElhaney's King of the West is looking well, and also preparing to ship—to Hailey, if the road is completed; or Ketchum, if there be no other road. McCarter's mine looks well, the tunnel having tapped the ledge at a depth of 150 feet. On Pierce Dorgan's Galore six or eight men are employed, night and day. There are 60 sacks of rich ore on the dump, ready to ship, and a good quantity in sight. Geo. H. Merrill's prospect, below the Galore, shows a small vein of chloride, carbonate and galena carrying native silver. The miners there are also sacking ore. There are 25 Chinamen hydraulicking in Newton River's placer claims—to which point the road will be completed in a couple of days; but it will have to stop there unless the people of Hailey pay up their subscriptions and enable the contractor to keep working. The road is now completed to a point five miles from the Carrie Leonard Creek,

THE IDAHOAN MINE.—It is stated that in a few days the Idahoan management will declare a dividend of $4,000, payable immediately, and that this will probably be followed by monthly dividends for at least equal amounts all through the summer and fall. The above will be most welcome news to this community, as the Idahoan, like the Parker, is owned entirely by parties residing here.

WOOD RIVER OUTLOOK.—*Times*, June 10: Slowly, gradually, the clouds which have hung over the financial sky of Wood River for months, are disappearing before the steady improvement reported from all the ore-yielding regions tributary to us. Lava Creek shows at least three first class prospects besides the noted Horn Silver, and has already commenced shipping ore here. The Smoky districts are only awaiting the opening of the new wagon-road to turn the ore-stream this way. Rock and Camp creeks—the gold-bearing belt—are beginning to show some activity, and bullion will soon be rolling in from there. The base-metal mines on the near slope of the Rock creek water shed are already shipping, and will soon double their output. Deer Creek will, this year, do better than ever, as there will be three producing claims for every one heretofore. The East Fork of Wood River will likewise yield more largely. The Hailey Concentrating Works are running to their full capacity, with ore enough in control to run all summer. Colorado and Star gulches have already commenced to yield up their winter's accumulations; while Croy gulch shows at least one bonanza—the Climax—besides three other good claims. Then, the low grade ore proposition is also "looking well;" Mr. Havens has over 4,000 tons of that class of ore promised him. If he only gets one-fourth of that amount it will be so much redeemed from the waste dumps and hitherto unproductive claims. Bullion is the only camp which does not hold out very flattering promises. Yet even that vicinity does not look so very discouraging, after all. The Idahoan is about to declare a dividend; the Cyclops—on the Divide—is showing up a bonanza; and the Bullion-Ophir tunnel will be in the ore chimney in two or three weeks. The upper country is about to have a concentrating works—the Silver King—and much ore can doubtless be marketed now which was beyond reach before. Near Bellevue, the Minnie Moore shows steady improvement, and is only awaiting Superintendent Palmer's return from England to resume shipments; while the Queen of the Hills Company will doubtless remain a dividend-payer this year, at least. Below Bellevue, Resurrection District is showing much good ore and promising to show a mill soon, if Hon. John Hailey ever gets back from Washington. Taken as a whole, the local mining outlook is quite favorable—as much so as it has ever been.

THE OPHIR MINE.—Ketchum *Keystone*, June 10: The mining outlook up on Boulder Creek is brightening every day. The Ophir is the leading attraction at that point just now. This property has been worked for the past two seasons, but mostly in the way of tunneling and opening the mine. The main tunnel is in 100 feet and has been run through pay rock from the face of the hill. Fifty feet in a shaft has been sunk to a depth of thirty feet and is on a two-foot vein of galena and carbonate ore. At the end of the tunnel a shaft has been sunk to a depth of seventy-five feet, which has been cut through ore of sufficient value to pay the expense of sinking the shaft. From the bottom of this shaft a tunnel has been run toward the face of the hill, directly under the main tunnel, for a distance of thirteen feet and is in a two-foot vein of galena and carbonate ore. The assays show 150 ounces in silver, one ounce in gold and a considerable quantity of lead to the ton. The contract for packing the ore a distance of six miles to an accessible wagon-road was to have been let last evening, and the delivery of ore at the Philadelphia Smelters to be commenced about the 10th instant. The product of this mine in 1883 was only about sixty tons, in 1884 275 tons, but this season no estimate can be placed upon the probable output—all the way from 500 to 1,000 tons, and possibly more. The lucky owners of this valuable mining property are G. L. and H. J. Murdock, J. H. Beatty, T. F. Shaw and C. W. Weaver. They all feel much elated over the prospects of their mine, and well they may.

MONTANA.

RICH MINES.—Helena *Independent*, June 6: Messrs. Ryan, Cannon and Holter, who have been out to Belmont, returned on Thursday evening, and were yesterday sought by a reporter of the *Independent*, who gathered from them many interesting facts concerning what they saw. They went out to look at the Empire, Homestake and M. L. Lode, owned by Messrs. Ryan, Lane and Lynch, and express themselves as well pleased with the outlook of these mines. The Empire has on the east end of it a tunnel run in over one hundred and fifty feet in depth. At the end of the tunnel cross-cuts have been run, and a very rich body of gold and silver bearing ore has been struck, of a width of about twenty feet from wall to wall, the ore assaying from $80 to $700 per ton in gold, and will run as high as $35 in silver. Four hundred feet west of the tunnel is a shaft of over 50 feet deep, at the bottom of which is run a drift, and then a cross-cut, in which 10 feet of ore has been struck that averages from $80 to $100 per ton in gold and 30 ounces in silver. Eight hundred feet still farther west is a 65-foot shaft in which a 32-foot-drift has been run, with a cross cut at the end, showing a 10-foot body of ore which runs from $100 to $150 per ton. The M. L. has a 100-foot shaft on it, and shows ore on it that runs $80 in gold and $35 in silver. The Homestake has three different openings upon it, each one of which show ore that is immensely rich. Messrs. Cannon and Holter went out to take a look at these mines with a view, that if they showed up anything near what they were represented to, of purchasing. Judging from the glowing terms in which they speak a sale will soon be consummated. The gentlemen also give glowing accounts of other mines in the vicinity and of the Marysville mines. In the Drum Lummon a very rich strike has been made on the lower level of the drift heading north and shows up a vein of ore that is immensely rich.

COPPER MINES.—Butte *Inter-Mountain*, June 13: The Parrot mine is now producing ore at the rate of 8,000 tons per month. The extracted ore reserve is 6,000 tons, which is increasing, despite the active operation of the concentrator and smelter. The mine is in good shape. The 330-foot level has been extended to the east and west end lines, but the stopes expose an abundance of ore, and further sinking will not be resumed until fall.

CLARK'S COLUSA.—The output of Clark's Colusa is now 175 tons daily, chiefly from the 200-foot level. On the 300-foot level no stoping has been done and immense quantities of ore are available for extraction. The walls are 80 feet apart and in one place, between the 100 and 200 foot levels where ore is now being extracted, no sets of timber are required and the pay ore body is 50 feet wide. The mine is now being put in good working shape and that part of the shaft above the 200-foot station will be newly timbered. The concentrator is treating 80 tons of ore daily. The smelter will resume operations in a few days.

GAGNON.—The Gagnon is being worked on the 400, 500 and 600 foot levels and the ore product averages 40 tons daily, which amount is concentrated and worked at the Colorado smelter.

MOUNTAIN VIEW.—C. X. Larabie is opening up immense ore reserves in the lower levels and making regular shipments of crude ore. The property could readily supply a smelter as big as that of the Parrot Company and still its productive resources would not be unduly taxed.

NOTES.—The Montana Company are working the Colusa, West Colusa and Montana Parrot, and are extracting more ore than the smelter can treat. The Clear Grit is sending its copper-silver product to the Colorado smelter. The Bell keeps the smelter well supplied with good ore.

OREGON.

A BONANZA.—*Sentinel*, June 10: Where the big discovery was made on the Yank ledge is the portion formerly owned by Wm. Bybee of this place. Eight men are now employed in running two tunnels with the rock now running all the way from $8 to $400 per ton. When the size of the ledge is taken into consideration—240 feet wide and can be traced for 30 miles—it will take a better mathematician than we are to figure out what all will yield. As was at first generally supposed work has not been suspended on account of Mr. McNevin's death and the digging of the tunnels will be continued right along. Taking in view the dimensions of the ledge, with the new cheap processes lately invented for working quartz, and then estimating the whole at the very lowest assay yet made of the rock, which is $8 per ton, it would cause the making of more millionaires and building up of a town longer lasting and much better than the palmiest days seen by Virginia City, Nevada. Leading capitalists of California have got hold of this mine and ex-Governor Chadwick will take McNevin's place in charge of the work. This discovery will also tend towards the opening out of the numerous quartz ledges in this end of the State and the prospects of Southern Oregon now look brighter than ever.

UTAH.

REVIEW.—Salt Lake *Tribune*, June 12: The shipments from this city for the week ending Saturday, June 6th, inclusive, were 1,622,333 pounds. The receipts of bullion and ore in this city for the week ending June 10th, inclusive, were $72,515.79 in aggregate, of which $63,615.79 was bullion and $8,900 ore. The week previous the receipts were $79,034.78 in bullion and $13,720 in ore, a total of $92,754.78. The shipments of the Ontario for the week were 43 bars of bullion, of the value of $34,556.43, bringing the total product for this year to date up to $730,257.72. All goes well at the mine and mill, and the monthly dividends continue with undeviating regularity. The sandstones yielded $10,359.38 during the week, of which three silver bars, valued at $5,500, were from the Stormont, and three silver bars, $4,859.36, from the Christy. The product from the Hanauer smelter for the week was seven cars of bullion, assaying $13,000.

SANDSTONE MINING NOTES.—Southern Utah *Times*, June 13: The leaching works are kept running to their full capacity, with profit to the proprietors. Charles Miles sold his interest in the Vanderbilt to M. H. Quirk and C. H. Balch last week—Dick Richards still retains his interest. There are now four men at work on the mine. It is the intention of the new company to vigorously prosecute work on this valuable property. In constructing a new road to convey the ore from the Emma mine, last week, a six-inch ledge of high grade ore was uncovered. A sample of the ledge assayed 710 ounces of silver per ton. Fourteen tons of ore taken from the old workings was shipped to the Christy mill this week. The Emma adjoins the Vanderbilt, and is owned by J. B. Smith and Dick Jarmin who feel elated with the present outlook.

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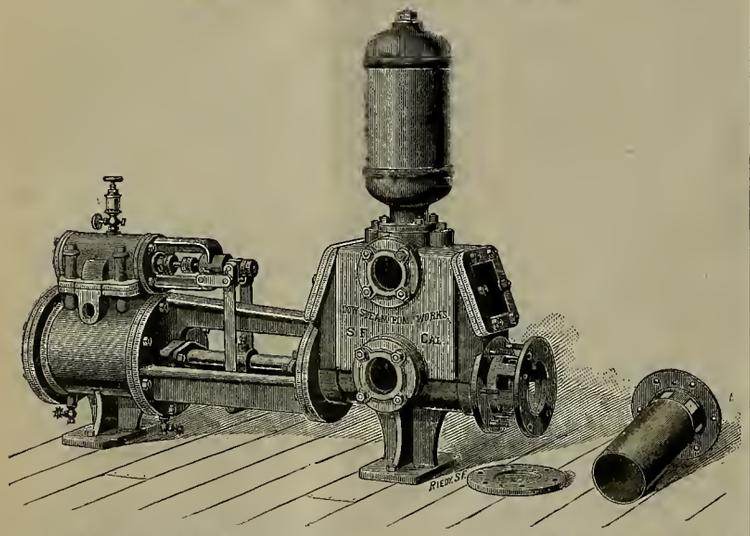

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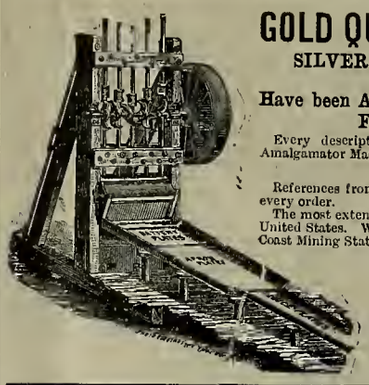

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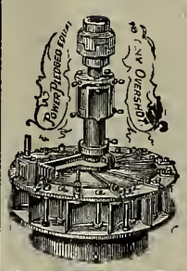

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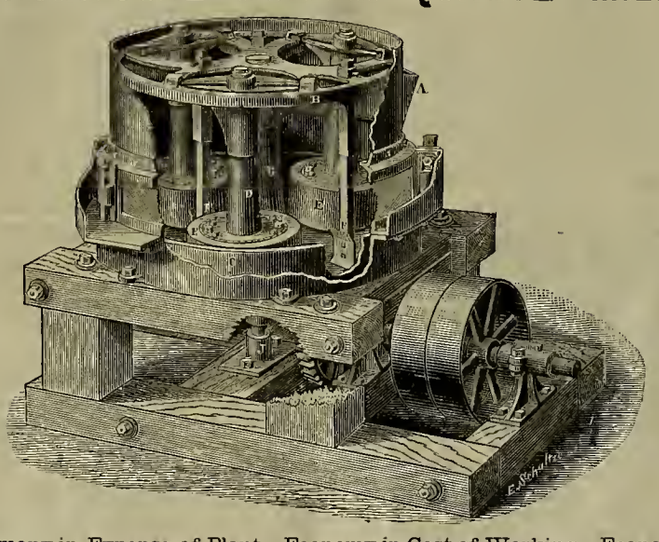

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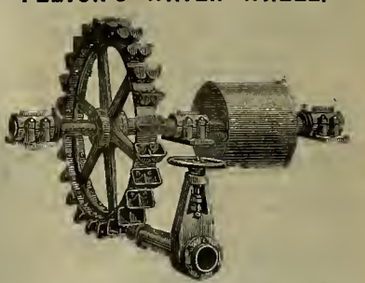

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Shasta County Districts.

[From our Traveling Representative.]

The work of opening up mining property continues with more or less remunerative results throughout the county, the success of a district oftentimes resulting in the discovery of an adjacent one by the general prospecting now going on. In a number of districts a great deal of quiet work is progressing, of which hut little talk is made. If a continuance of this state of affairs can be maintained, the mining interests of the county will enjoy a standing deserving of encouragement. In case of a failure in some cases the detriment to the merits of the county will not he any more hurtful than the suspension of an honest business man who pays dollar for dollar and starts in again. Heretofore the working of poor mines in the face of positive proof of their worthlessness in the blind hope of "lightning striking" deeper or farther in, has hurt Shasta county. Such doings are going out of favor here, although now and then some crauk with more sand than sense runs in debt and spends other people's money in carrying out a persoual hobby or putting up a mill before having either prospect or mine.

Prosperous Districts.

Old Diggings, seven miles northerly from Redding shows more activity than for years past. The district is situated most advantageously as to hring near water and railroad. The nnmher of mines opening up, and in many cases with excellent indications, is encouraging to both the prospector and district resident, or business men from whom supplies are bought. Manufacturers of mining and milling machiuery have been benefited by the renewal of work in this camp, as a number of mills, concentrators and considerable mining machinery has been shipped to the camp.

The quartz vein matter lies between sla'e and porphyry, the ledges varying in width from stringers to twelve feet wide. As yet the camp hoasts of nothing but good prospects, as but little depth or length has been made on the contacts. There are a number of small mills in the district, and as usual with prospering camps lots of talk ahout many mills soon to go up. A lack of moneyed men places the camp on the "after awhile" list, as loss of muscle and not much money takes time to bring out mines that need means as well as work.

Old Diggings Concentrates.

Very rich—Old Diggings sulphurets.

The Sacramento river is one mile distant.

Dale and Hiatt are opening a good prospect near the Mammoth.

Steam power is necessary to run mills and deep mines of this camp.

Two arastras are running on high grade ore on the Fleming property with filthy lucre results.

The fare from San Francisco to Redding is $9.10 via the Oregon division of the C. P.; time 10 hours.

Dan O'Neil has a cannon-ball mill on his prospect; as yet, however, he has no concentrators to save his sulphurets.

Reid & Coe have a ledge from two and a half to four feet wide and are down 100 feet. They have some 400 tons of ore on the dump that is said to rnn from $10 to $40 per ton. They are negotiating for a mill.

The Mammoth mine has opened up a ledge from 4 to 12 feet wide that runs from $12 to $25 per ton, and carries hut little sulphurets. This is an old mine and has a great deal of development work done on it.

The Central, owned hy Judge Aaron Bell and others of Shasta, is looming up in good shape. A depth of 120 feet has been reached showing a ledge from 2 to 10 feet that assays $22 and $25 per ton. The percentage of sulphurets is large and runs high in gold. Recent assays of sulphurets run $28,000. A 5-stamp mill with Duncan concentrators will probahly he placed on the mine in a short time.

Shasta.

For some years past Shasta, the county seat, has been "about the same." It isn't every camp that can hang out ahout the same right along. Mining in the immediate district is quiet, cxtremely so. Newcomers who throug the county looking for mines they read about, and the activity in recording claims at the Clerk's office, has stirred up many "old time rocks" to get out and rustle. The consequence has heen fruitful to the landlord, storekeeper, freighter and last hut not least to the saloon keeper. As the country away from Lome is taken up and prospected, that near Shasta will he worked as a last resort and probahly pay better than the other. Business men and professionals are gruh-staking reliable prospectors, and already there dawns bright visions for the future of both Shasta and her hospitable people.

Shasta Notes.

Shasta has a fine hotel.

Miuing in the vicinity of Whisky town is at a standstill.

The fare from Redding or Middle Creek to Shasta is $1.

The town is headquarters for mine owners and the legal lights of the county.

"Old times come again," said the oldest inhahitant, as he pointed to a jack train starting out with supplies to a miniug district.

Thero is talk of the Mad Ox, an excellent property near Whisky town, starting up soon. This mine has paid hig money in the past.

The Shasta *Courier* resemhles the county in many respects. For some time past husiness did not justify much push or enterprise; now that things are looking better, Bro. Carter is bracing up and keeping ahreast with the times.

Among others gambling with Dame Fortunc in mining is Col. Ed. Sweeney, Shasta's learned and popular District Attorney. Blackstone, geologically speaking, appears to pay hetter than "assaying" the contents of the law authority mentioned. In Eagle Creek district, four miles from Shasta, is situated the Sweeney honanza. Ore that paid $50 per ton has been shipped to Denver from this property. A good force of men are at work, and 80 feet in depth shows a good two-foot vein. St. Auhurn, a mining man of Deadwood, is interested with the Colonel in this prospect.

The "Lost Confidence," a misnamed group in the Iron Mountain district, adjoining the Flat Creek district, is attracting considerable attention by the excellent showing and fine results from shipments made. Messrs. Canden and Magee and others, of Shasta, are the owners. The ores are argentiferous, the formations being almost a *fac simile* of those of the Windy Camp group, fully described in the PRESS of June 6th. The extent of the ore body is almost incredible. The owners are very reticent as to their future intentions; also, as to the grade of their ores. Regular shipments from this honauza have been made to Hill's Argo smelter, near Denver. The freight from Redding to Denver heing $19 per ton, and $15 per ton for treatment. The Denver people paying from 90 to 93 per cent on the assay value. On 500 oz. ore they pay as high as 95 per cent net. The Lost Confidence is workiug a good force of men, and if a sale is not effected soon, extensive machinery will be put up on the property. At present the group is held at a high figure. This property is the most promising in this vicinity.

Miscellaneous.

Comparatively speaking, but little prospecting is going on ahout Ono.

The Merchants' Bank of San Francisco is largely interested in mines ahout Igo.

Mining ahout Igo, owing to a scarcity of water and a monopoly owning the largest portion of prospecting ground and the entire water supply of the district, is not enjoying the prosperity that it would otherwise.

The putting up of a Huntington mill on the north fork of Cottouwood, hefore having sufficient ore in sight to even justify expenses, is a lesson that should not be lost sight of by the people in the vicinity of Ono.

Considerable attention has heen paid of late to the Spencer mine eight miles northwest from Ono. This mine is an unusually promising one, and if handled by capital instead of "pottering along," as it is uow doing, the results would be different. Notwithstanding the chances capital would be taking in opening up the property, it could not he had at anything like its actual value. The mine is situated most advantageous as to the easy development of its ore hody. An admirahle mill site, water power aud plenty of timber give the property advantages enjoyed hy hut few prospects. As far as development has progressed the indications are favorahle to the opening up of a fine mine. The ledge is a blind one tapped about 100 feet deep by a 200-foot tunnel from the side-hill. The ore body is a quartz, the center of which appears firm, while on either side next to the walls the quartz is of a decomposed crumhly nature mixed here and there with a yellow sedimentary matter that runs well in gold. The vein matter on the level tapped is nearly 14 feet in width. A shaft down 90 feet from this level shows firm walls, hut a pinching out of the more solid quartz and the existence of a soft conglomerate sedimentary matter with streaky deposits of partially decomposed quartz, the matter milling probahly $12 per ton. One hundred feet more depth will probably either open up or shut down the mine as a desirable property. F. W. S.

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, June 18, 1885.

ANTIMONY—Per pound		@	—
Hallet's	12	@	—
Cookson's	13	@	—
BORAX—Refined		@	8½
IRON—Glengarnock ton	25 00	@	—
Eglinton, ton	23 50	@	—
American Soft, ton	27 00	@	—
Oregon Pig, ton		@	—
Clipper Gap, Nos. 1 & 4	25 00	@	30 00
Clay Lane White	26 00	@	—
Shotts, No. 1	26 00	@	—
STEEL—English, lb	16	@	25
Black Diamond, ordinary sizes	13	@	—
Plow	6	@	8
Machinery	10	@	12
Sanderson Bros	13	@	—
COPPER—			
Braziers' sizes	—	@	25
Fire-box sheets	23	@	—
Bolt	22	@	—
Yellow Metal	14	@	15
Ingot	14	@	15
LEAD—Pig	3½	@	3¾
Bar	5	@	—
Pipe	7	@	—
Sheet	8	@	—
Shot, discount 10% on 500 bag Drop, ¾ bag	1 85	@	—
Buck, ¾ bag	2 05	@	—
Chilled, do	2 25	@	—
TINPLATE—Oldcastle	6 25	@	6 00
Charcoal	5 75	@	6 75
ZINC—German	9	@	10
Sheet, 7x3 ft, 7 to 10 lb, less the cask	9	@	10
QUICKSILVER—By the flask	35 50		
Flasks, new	1 05	@	—
Flasks, old	85	@	—
NEW YORK PRICES—			
California Borax, refined	8	@	8¼
Pig Iron, American	17 00	@	18 00
Quicksilver	42	@	—
Lead	3 70	@	—
Copper	11¾	@	—
Tin	21¼	@	—
Bar Silver	1 06½	@	—

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS.

ASSESSMENTS.

COMPANY.	LOCA'N.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alta S M Co	Nevada	32	25	Apr 30	June 4	June 24	W H Watson	302 Montgomery st
Aultman M & M Co	California	2	01	June 15	July 20	Aug 10	J M Buffington	309 California st
Baker Divide M Co	California	9	25	May 12	June 15	July 6	D M Kent	330 Pine st
Best & Belcher M Co	Nevada	32	50	June 2	July 9	July 28	W Willis	308 Montgomery st
Challar M Co	Nevada	16	50	May 11	June 24	July 15	C E Elliott	309 Montgomery st
Con Imperial M Co	Nevada	22	10	May 20	June 20	July 15	C L McCoy	329 Pine st
Caledonia M Co	Dakota	16	15	May 28	July 10	Aug 5	W L Oliver	328 Montgomery st
Ehtracht Gravel M Co	California	18	05	May 26	June 30	July 18	H Kunz	209 Sansome st
Endowment M Co	Nevada	5	50	May 19	June 22	July 20	E M Hale	327 Pine st
Golden Gate M & M Co	Nevada	2	25	June 11	July 14	Aug 1	R Hewston	314 Montgomery st
Golden Fleece G M Co	California	1	20,00	Apr 18	June 8	June 27	F Schirmeier	Phelan Block
Gould & Curry M Co	Nevada	53	40	June 1	July 8	July 29	A K Durbrow	309 Montgomery st
Gold Canyon M Co	California	1	2½	June 10	July 13	Aug 4	F A Berlin	423 Montgomery st
Homeward Bound M Co	California	4	25	June 12	June 20	Aug 11	D A Smith	209 Post st
Hale & Norcross S M Co	Nevada	85	50	May 6	June 9	June 29	E B Holmes	309 Montgomery st
Iowa M Co	Nevada	17	05	Apr 29	June 6	June 27	C C Lenvitt	510 Battery st
Loreto M and M Co	Mexico	08	15	Apr 28	May 29	June 22	H G Jones	327 Pine st
Mayflower Gravel M Co	California	30	40	June 4	July 20	Aug 11	J Morizio	328 Montgomery st
Mono M Co	California	22	50	June 17	July 22	Aug 11	G W Sessions	309 Montgomery st
Navajo M Co	Nevada	11	25	May 25	June 29	July 20	J W Pew	310 Pine st
Pay Day M Co	Nevada	3	02	June 6	July 14	Aug 10	W Van Bokkeless	419 California st
Potosi M Co	Nevada	18	30	May 13	June 19	July 10	C E Elliott	309 Montgomery st
Puget Sound Iroa Co	Wash Ter	11	50	Apr 14	May 25	June 25	A Halsey	328 Montgomery st
Peerless M Co	Arizona	4	50	May 18	June 23	July 17	A Waterman	309 Montgomery st
Sierra Nevada M Co	Neva a	82	25	June 9	July 15	Aug 4	E L Parker	309 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
North Belle Isle M Co	Nevada	J W Pew	310 Pine st	Annual	June 20
Union Con M Co	Nevada	J M Buffington	309 California st	Annual	July 20

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Kossuth M Co	Nevada	C K Startevant	328 Montgomery st	06	Mar 16
Mt Diablo M Co	Nevada	R W Heath	418 Pine st	20	June 20
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Feb 13
Plymouth Con G M Co		W Van Norden, Pres	23 Nassau st, N Y	50	Apr 6
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Feb 16
Syndicate M Co	Nevada	J Stadfeld Jr	419 California st	10	May 5

Mining Share Market.

The attention of stock dealers is still directed to Hale and Norcross, and the fact that considerable water has been coming in has brought the stock down a peg or two.

It must be borne in mind that this striking of water in the ore sections has always been considered as most favorable for the development of an ore body, for ore bodies in the Comstock do not exist without water, and sometimes large and troublesome quantities of it.

Understanding well the situation, and having fortunes at stake, in reaching ont explorations after ore the drill is always kept feeling ahead, and every precaution taken to guard against any possible disaster from water or anything else. The water is draining out of the lower level. Several tons of good pay ore have been hoisted and sent to mill.

The north lateral drift from cross-cut No. 1, and the south lateral to meet it, from cross-cut No. 2, are both showing well in very good pay ore, and the winze being commenced from the floor of the 3,000 level in cross-cut No. 2, to sink deeper below that point in the most eligible and promising part of the ore vein, is showing richer ore than yet found anywhere at that depth. Some spots and streaks of it are very high grade, giving promise of ripening into a bonanza as further depth is attained.

The *Enterprise* says that vague rumors continue to be prevalent of concealed ore bodies in the north end mines, especially about the big bonanza section; also, of undeveloped ore bodies quiescent in certain mines not being worked; also, of proposed charges in control and management, which are to raise those stocks in a lively and refreshingly upward manner; but all these reports prove thus far to be decidedly of the mythical and unreliable character. The old bonanza sections of the north and south ends simply continue their very gratifying and prosperous yield of low grade ore, and some other mines of smaller magnitude and reputation give a daily contribution of bullion material.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, department 10, San Francisco:

PINE TREE M. Co., May 19.—Capital Stock, $10,000,000, Directors—Thos. R. Hayes, A. H. Griswold, Daniel E. Hayes, N. C. Wilson and A. G. Booth.

AERIAL STEAM NAVIGATION CO., May 18.—Capital Stock, $100,000. Directors—Wm. Patterson, A. Craig, J. G. Severance and Howard Livingston.

THE Ingersoll Rock Drill Co., of New York, have carried off the highest honors at the New Orleans World's Fair, where their handsome exhibit of rock drills, air compressors and other mining machinery attracted general attention. The judges have awarded them three first prizes, namely, a gold medal for the best rock drill, another for the best air compressor, and still another for the best display. In making these awards the judges, who had the best opportunity of appreciating the qualitiee of the different makes of machines placed in competition at the fair, have but confirmed the popular verdict and voiced the general opinion regarding the merits of the machines manufactured by the Ingersoll Co. The agents on thie coast are Messrs. Parke & Lacy.

THE State Salmon Hatchery at Redding will be finished this month.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING May 28.		WEEK ENDING June 4.		WEEK ENDING June 11.		WEEK ENDING June 18.	
Alpha	1.20	1.35	1.10	1.25	1.10	1.70	1.30	1.85
Alta	.30	.35	.30	.60	.50	.90	.50	.80
Andes	.55	.65	.45	.50	.55	.60	.35	.60
Argenta	....	.15	....	....	....	....	.05	.10
Belcher	1.20	1.25	..	1.10	1.10	1.40	1.20	1 60
Belding	....	....	....	....	....	....	....	....
Best & Belcher	4.00	5.00	3.35	3.95	3.70	3.95	2.45	3.75
Bullion	.40	.45	....	.40	.40	.50	....	.35
Bonanza King	....	....	....	....	....	....	....	....
Belle Isle	....	.25	....	.20	....	....	....	....
Bodie Con	1.40	1.45	1.40	1.55	1.55	2.25	1.50	2.20
Benton	....	....	....	.10	....	.15	.10	.15
Bodie Tunnel	....	....	....	....	....	....	....	....
Bulwer	.40	.45	.40	.45	.45	.50	.45	.55
California	....	....	1.60	3.15	2.50	3.45	1 90	3 25
Challenge	....	....	....	.25	.25	.30	....	.25
Champion	....	....	....	....	....	....	....	....
Challar	2.10	2.50	1.80	2.45	2.25	2.65	1.45	2.50
Confidence	....	....	....	1.75	....	....	1.55	1 80
Con. Imperial	....	.10	....	.10	....	.10	....	.10
Con. Virginia	2.00	2.30	1.60	3.15	2.50	3.45	1.90	3.25
Con. Pacific	....	....	....	....	....	....	....	....
Crown Point	1.40	1.45	1.35	1.55	1.40	2.30	1.25	1.80
Day	....	....	....	....	....	....	....	....
Eureka Con	7.60	7.12	7.62	7.75	....	7.87	7.50	8.00
Eureka Tunnel	....	....	....	....	....	....	....	....
Exchequer	.35	.45	....	.30	.35	.40	.25	.45
Grand Prize	....	....	....	....	....	.70	....	....
Gould & Curry	2.10	2.70	2.00	2 35	2.15	2.35	1.40	2.20
Goodshaw	....	....	....	....	....	.05	....	....
Hale & Norcross	6.62	7.37	6.75	7.37	7.12	8 25	7.00	7.75
Holmes	4.50	4.75	1.75	4.75	4.75	5.40	....	....
Independence	....	....	....	....	....	....	....	....
Julia	....	....	....	.15	....	....	.15	.20
Justice	....	.15	....	.15	.15	.25	.15	.25
Martin White	....	....	....	....	....	....	....	....
Mono	1.05	1.25	.90	1.25	1 00	1.40	.80	1.25
Mexican	1.25	1.45	1.05	1.25	1.15	1.80	1.25	1.75
Mt. Diablo	....	4.00	....	....	....	....	....	....
Northern Belle	....	....	....	....	....	....	....	....
Navajo	.90	1.25	.90	1.30	.85	.90	.85	1.00
North Belle Isle	....	....	....	.10	....	....	....	.15
Occidental	1 75	1 70	....	1.50	1.50	1.60	....	1.50
Ophir	1 60	1.75	1.30	1.75	2.00	2.75	1.00	2.25
Overman	.35	.50	.20	.50	.40	.65	.40	.75
Potosi	.35	1.00	.70	.85	.85	.95	.85	1.05
Final Con	....	....	....	....	....	....	....	....
Savage	3.85	4.15	3.60	4.20	4.00	4.80	2.75	4.60
Seg. Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	1 35	1.60	1.20	1.40	1.50	2.60	1.35	1.80
Silver Hill	....	....	....	....	....	....	....	....
Silver King	....	....	....	3.00	3.00	3.75	....	....
Scorpion	.15	.25	.15	.20	....	.20	.15	.20
Syndicate	....	.40	.30	.40	.30	.35	....	.35
Tioga	....	....	....	....	....	....	....	....
Union Con	1.25	1.50	1 15	1.40	1.30	1.80	1.15	1.30
Utah	1 80	2.00	....	2.40	3.00	2.50	3.00	
Yellow Jacket	2.65	2.85	2.55	2.75	2.70	2.80	2.35	3.00
....	....	....	....	....	....	....	....	....

Sales at San Francisco Stock Exchange.

THURSDAY A. M., June 18.

100	Andes	65c	2185
170	Alta	65c	280
50	Alpha	1.35	210
480	B. & Belcher	2.75@2.80	400
450	Bullion	40c	570
1675	Bodie Con	1.20@1.25	1500
110	Belcher	1.25@1.30	1420
2450	Challar	2.25@2.35	740
890	Con Va & Cal	2.25@2.30	200
200	Caledonia	15c	50
30	Crown Point	1.40	200
300	Exchequer	30c	50
270	Gould & Curry		1.65
1425	Hale & Nor		7.25@7.75
280	Justice		20c
210	Mexican		1.40@1.45
400	Ophir		1.65
570	Overman		50c
1500	Potosi		1.15@1.20
1420	Savage		4.20@4 25
740	Sierra Nevada		1.55
200	Scorpion		20c
50	Union		1.35
200	Utah		2.50
50	Yellow Jacket		2.25

Bullion Shipments.

Hanauer, June 9, $3,900; Queen of the Hills, 9, $1,400; Ontario, 10, $34,566; Hanauer, 12, $2,300; Queen of the Hills, 12, $1,200; Hanauer, 13, $4,700; Stormont, 14, $3,080; Queen of the Hills, 14, $1,100; Hanauer, 14, $2,600. The Banks of Salt Lake City report the receipt for the week ending June 10th, inclusive, of $63,615.79 in bullion, and $8,900 in ore, a total of $72,515.79.

Gold Mines For Sale.

Two small gold mines for sale, in Kern county, California. Ore has paid by arastra $20 per ton. Worked to a depth of 60 feet. The vein is 15 inches wide. The mines are within seven miles of the Southern Pacific Railroad. The owner is not in a position to develop them without aid. The purchase price is very reasonable and there is a good opening for any one to take hold of the claims and work them. Address W. L., P. O. Box 2361, San Francisco.

PRICES reduced on all compound lenses required to be duplicated. C. Muller, optician, 135 Montgomery street, near Bush, opposite Occidental Hotel.

The Bartholdi Statue.

The steamship Isere arrived this week in New York with the famous Bartholdi statue of "Liberty Enlightening the World," which has been

presented to the United States. The weight of this stupendous statue is 440,000 pounds, of which 176,000 pounds are copper, and the remainder wrought-iron. It will he erected on Bedloe's Island, this heing the location selected for it hy Gen. Wm. T. Shermao, who was appointed hy the President to make the selection. When placed in position it will loom up 305 feet ahove tide-water, the hight of the statue heing 151.2 feet, that of the pedestal 91 feet, and foundation 52.10 feet.

The committee iu charge of the erection of the pedestal for the reception of this great work have prepared a heautiful statuette, as a souvenir to send to each person who subscribes $1.00. The proprietors of the paper have secured from Richard Butler, secretary, New York, a limited number of these statuettes, and will send one prepaid by mail or express to any subscriber of this paper or the persou who will scnd us $5 worth of new subscribers while this notice remaios in this paper. Donations can he made direct to the fund by scnding the amount to this office, the receipt of which will he published in our columns and the amount duly forwarded to the commissioners in New York.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & CO.'S SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING JUNE 9, 1885.

319,776.—ARTIFICIAL FINGER—I. Bashore, Walla Walla, W. T.

319,549.—TREATING POMACE FOR KEEPING THE EXTRACT CLEAR—A. Blaker, Shedd, Or.

319,559.—BOILER TUBE EXPANDER—M. Cashin, S. F.

319,679.—AXLE LUBRICATOR—J. M. Denny, Wartsburg, W. T.

319,468.—SPITTOON—Dorsey & McQuarrie, Walla Walla, W. T.

319,572.—BOLTING REEL—Francis Ferrier, Vallejo, Cal.

319,816.—METAL CUTTING TOOL—G. Hoefer, Champoeg, Or.

319,586.—SEED SOWER—G. E. Kaltmeyer, San Buenaventura, Cal.

319,911.—LUMBER MEASURER—E. Y. Knapp, Arcata, Cal.

319,912.—ELECTRIC ENGINE—W. A. J. Kohrn, S. F.

319,610.—ORE AND SALT DRIER—A. A. Nevin, S. F.

319,929.—CABLE RAILWAY—Henry Root, S. F.

319,857.—ORE CONCENTRATOR—E. W. Sinclair, Tombstone, A. T.

319,639.—BRICK MACHINE—C. A. Tarragon, Portland, Or.

319,640.—GRAPE CRUSHER AND PRESSER—Isaac Thayer, S. F.

319,657.—GOLD SAVING APPARATUS—V. P. Velmini, Sutter Creek, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possibls (by telegraph or otherwise), at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

THE Yosemite Commissioners have agreed on a site for the hotel to he huilt in the Yosemite Valley, and for which the Legislature appropriated $40,000. It is at the hase of Glacier Point Rock, and around it are splendid views.

NEW BOOKS ON ASSAYING.

BY C. H. AARON.

PART I.—Gold and Silver Ores.—Price $1.

This new work is written hy an experienced metallurgist who has devoted many years to assaying and working precious ores on the Pacific side of the American Continent. He writes whereof he knows from personal practice, and in such plain and comprehensive terms that neither the scientist or the practical miner can mistake his meaning.

The work, like Mr. Aaron's former publications ("Testing and Working Gold and Silver Ores," "Leaching Gold and Silver Ores") that have been "successfully popular" is written in a condensed form, which renders his information more readily available than that of more wordy and less conscientious writers. The want of such a work has long been felt. It will be very desirable in the hands of many

Table of Contents:

Preface; Introduction; Implements; Assay Balance; Materials; The Assay Office; Preparation of the Ore; Weighing the Charge; Mixing and Charging; Assay Litharge; Systems of the Crucible Assay; Preliminary Assay; Dressing the Crucible Assays; Examples of Dressing; The Melting in Crucibles; Scorification; Cupellation; Weighing the Bead; Parting; Calculating the Assay; Assay of Ore Containing Coarse Metal; Assay of Roasted Ore for Solubility; To Assay a Cupel; Assay by Amalgamation; To Find the Value of a Specimen; Tests for Ores; A Few Special Minerals; Solubility of Metals; Substitutes and Expedients; Assay Tables.

The volume embraces 106 12mo. pages, with illustrations, well bound in cloth; 1884. Price, $1, postpaid. Sold by DEWEY & CO., Publishers, No. 252 Market street, San Francisco.

PARTS II AND III.

Lead, Copper, Tin, Mercury, etc.

Price $1.75.

This book is entitled "Assaying—Parts II and III," and is separate from Part I, and treats of Gold and Silver Bullion, Lead, Copper, Tin, Mercury, Zinc, Nickel, Cobalt, etc.

Table of Contents:

Gold and Silver Bullion; Apparatus; Melting Bullion; Assaying Bullion; Humid Assay of Silver; Manipulation, etc.; Lead Ores; Copper Ores; Volumetric Assays; Parkes' Process; Amalgamation; New Process; Preparation of Potassium Zanthate; Electrolytic Determination of Copper in Ores, etc.; Assaying of Tin Ores; Assaying of Mercury Ores; Assaying of Zinc Ores; Assaying of Zinc Ores, New Method; New Assay of Nickel and Cobalt; Assay of Chromium; Assay of Bismuth; Assay of Arsenic; Assay of Antimony; Assay of Sulphur; Assay of Salt; Appendix to Part I; Notes on Crucible Assays; Weighing by Oscillations; Appendix to Part III; The Assay of Lead; The Assay of Copper.

There are 160 12mo. pages with illustrations in the volume, which is bound strongly in cloth. Price postpaid, $1.75. Sold by DEWEY & CO., Publishers, No. 252 Market St., S. F.

These are much needed books for miners and other practical men, by an intelligent miner and assayer and careful writer. They are invaluable for the mill and mine worker, and equally good for scientific experts. They are thoroughly practical books.

ADDRESS all correspondence to the name of the paper or firm, as either of the publishers or editors connected with the office are quite likely to he absent at times.

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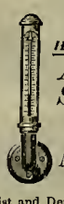

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NOTICE TO ARCHITECTS.

$250 for Plans.

THE DIRECTORS OF THE INSANE ASYLUM OF Arizona propose to erect an asylum of sufficient size and capacity to accommodate 100 patients, near the City of Phoenix, in Maricopa county, Arizona Territory, and for the purpose of obtaining plans and specifications suitable for such an institution, hereby make the following offer to Architects, namely:

FIRST. The Directors will receive plans and specifications offered by Architects, and place on file with their Secretary, N. A. Morford, at Phoenix, Arizona, on or before the 3d day of July, 1885.

SECOND. On said day, or as soon thereafter as practicable, the Directors will examine all the plans and specifications offered, and if any one of them shall be approved by the Directors and adopted for the construction of said asylum, they will pay to the party offering the same, two hundred and fifty dollars; but the Directors reserve the right to reject all plans and specifications offered.

THIRD. The material to be used in the construction of the buildings will be brick, iron, and wood, unless some different material shall be found which is more desirable and which can be supplied for an equal cost.

FOURTH. The cost of the whole construction must not exceed $45,000.

FIFTH. The buildings must be complete in themselves, but so arranged that their capacity may be largely increased with facility by additions without changing or removing the structure.

SIXTH. The prices of material and labor at the site of the building will be approximately as follows, viz.:

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WAGES. Carpenters, per day	4 00
Bricklayers, per day	5 00
Laborers, per pay	2 00
Painter, per day	4 00
Plasterer, per day	5 00

SEVENTH. The climate is temperate, but the mercury ranges high during about three months of the year, and then it drops to the freezing point in winter, occasionally, and hence provisions must be made against extremely warm as well as cold weather. The temperature ranges approximately as follows:

	Maximum, Means for 1884.	Minimum, Means for 1884.
January	70.1	31.1
February	70.5	34.5
March	76.1	32.0
April	85.2	40.8
May	03.4	40.1
June	103.4	55.7
July	109.0	66.3
August	104.2	63.2
September	89.9	48.3
October	93.0	51.3
November	83.2	40.1
December	67.8	36.1

All plans and specifications sent by mail or express must be prepaid and marked "Plans and Specifications for an Insane Asylum," and addressed to the Secretary of the Directors of the Insane Asylum, Phoenix, Maricopa County, Arizona.

Plans and Specifications will be returned, if required, on receipt of cost of transportation. N. A. MORFORD, Sec'y Board of Insane Asylum Directors.

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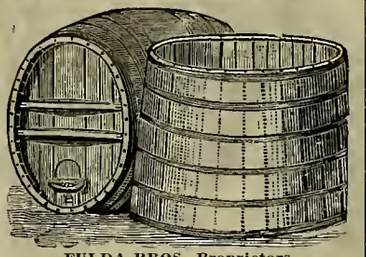

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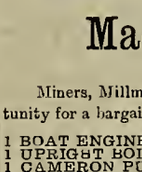

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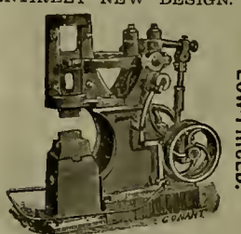

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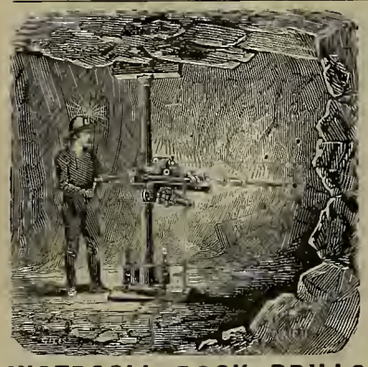

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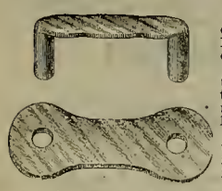

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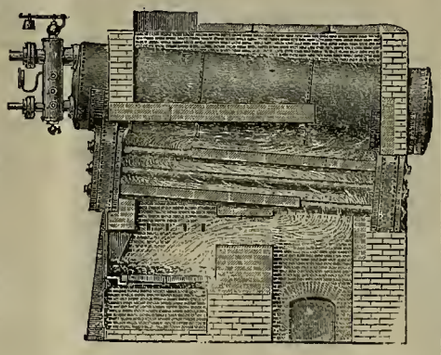

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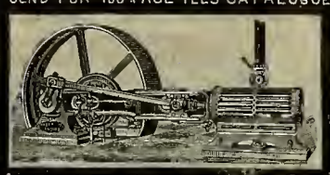

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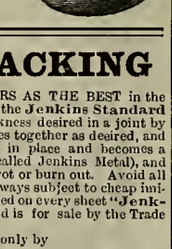

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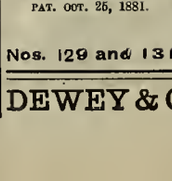

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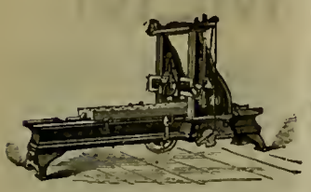

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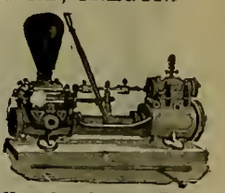

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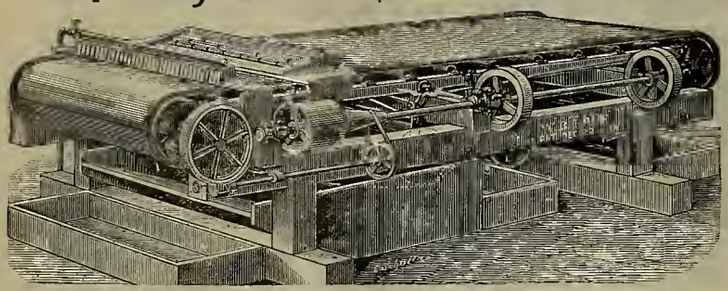
JUSTINIAN CAIRE, Dealer in Mining Material, Agent, 521 and 523 Market St., San Francisco, Cal.

$1,000 CHALLENGE!



THE FRUE ORE CONCENTRATOR, OR VANNING MACHINE.

PRICE: FIVE HUNDRED AND SEVENTY-FIVE DOLLARS, ($575 00), F. O. B.

OVER 1,000 ARE NOW IN USE. Saves from 40 to 100 per cent more than any other Concentrator Concentrations are clean from the first working. The wear and tear are merely nominal. A machine can be seen in working order and ready to make tests at the Fulton Iron Works, No. 220 Fremont Street, San Francisco.

As the result of a suit East against an End-Shake Machine (the Embrey), similar to the Triumph, the Frue Vanning Machine Company owns the Embrey patent, and can put in the market an End-Shake Machine of earlier patent that will do as good work as the Triumph, and superior in construction and durability. There will be no risk of suit for infringement.

The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement on patents owned by them.

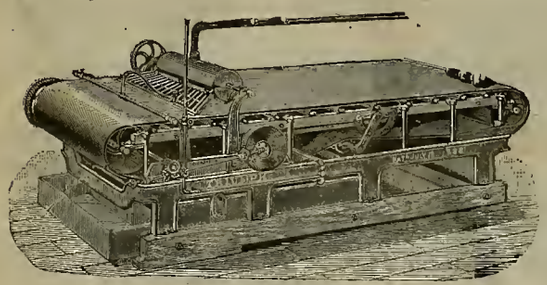
Protected by patents May 4, 1869, Dec. 22 1874, Sept. 2, 1879, April 27, 1880, March 22, 1881, Feb. 20, 1883, Sept. 18, 1883. Patents applied for.

N. B.—We are and have been ready at any time to make a competitive trial against the Triumph, or any other Concentrator for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Co.,

Room 7—No. 109 California Street. - - - SAN FRANCISCO, CAL.

$1,000 CHALLENGE ACCEPTED!



THE "TRIUMPH" ORE CONCENTRATOR.

PRICE, FIVE HUNDRED AND FIFTY DOLLARS ($550.00), F. O. B.

THE "TRIUMPH" TRIUMPHANT!

In a competitive trial recently had between two of the "Triumph" Ore Concentrators and the same number of "Frue" Vanning Machines, at the mill of the celebrated gold producing Original Empire Mill and Mining Company, in Grass Valley, Nevada County, Cal., the "Triumphs" produced thirteen and fifteen one-hundredths (13.15) per cent more concentrations than did the "Frue" Vanners, during a run of twenty-four consecutive days, or a net gold coin result of $199.15, or $8.30 per day, in favor of the two "Triumph" Concentrators.

These returns do not include the value of the amalgam saved by the "Triumphs" during the test; which will add to the net gain. The form of construction of the feed bowl is such that considerable amalgam is necessarily saved, which is lost on the "Frue" Vanners.

This trial was conducted under the personal supervision of the Manager and Superintendent of that Company, in a strictly fair and impartial manner, and with the sole view of determining, in the interest of that Company, the merits and demerits of the respective machines by a thoroughly practical test. A relation of the course of procedure, a concise analysis of assays, and a tabulated statement of the net bullion results, with a curate deductions therefrom, will soon be published in Circular form.

The superiority of the present construction of the "Triumph" over the form originally introduced, together with the demonstrated results of the above, and other trials had with the "Frue" Vanners, induce us to and we **hereby accept the Challenge of $1,000**, flaunted by the Agents of the "Frue Vanning Machine Company," and hold ourselves in readiness to enter into a second competitive trial for that sum, at such place and upon such terms and conditions as may hereafter be mutually arranged.

We guarantee purchasers against all costs, expenses or charges incurred by reason of any infringements of any existing patents.

"Put up or shut up," and "Let the Best Machine win!"

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We are also prepared to CONSTRUCT and DELIVER in COMPLETE RUNNING ORDER, in any locality, MILLS, CONCENTRATION WORKS, WATER JACKET SMELTING FURNACES, HOISTING WORKS, PUMPING MACHINERY, ETC., ETC., of any DESIRED CAPACITY.

WATER JACKET SMELTING FURNACES

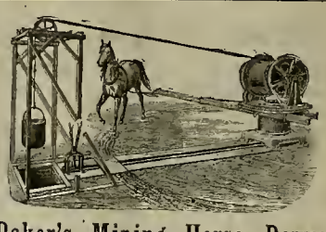
For COPPER and ARGENTIFEROUS LEAD ores of NEW and ORIGINAL DESIGNS, covered by LETTERS PATENT. No other Furnace CAN COMPARE with these for DURABILITY, and in CAPACITY for uninterrupted work. MORE THAN 150 of them are now RUNNING in various parts of THIS COUNTRY, as well as many in FOREIGN COUNTRIES, giving results NEVER BEFORE ATTAINED as regards CONTINUOUS running, ECONOMY of fuel, AMOUNT and QUALITY of BULLION produced. These CLAIMS have been PROVEN BY RESULTS in ANY NUMBER of INSTANCES, and the GREAT SUPERIORITY of this SYSTEM of smelting ores DEMONSTRATED BEYOND QUESTION. COMPLETE PLANS furnished to order of any CAPACITY, with ALL IMPROVEMENTS that experience has DEMONSTRATED as VALUABLE in this class of work.

WATER JACKET SMELTING FURNACES

THE DUNCAN CONCENTRATOR

Beyond question the cheapest and most effective machine of the kind now in use adapted to all grades and classes of ores.

This machine has been THOROUGHLY TESTED for the past TWO YEARS, under a GREAT VARIETY of CONDITIONS, giving most EXTRAORDINARY results FAR IN ADVANCE of anything EVER BEFORE REALIZED. A recent COMPETITIVE TEST at the Carlisle Mine in Mexico, showed an ADVANTAGE OF OVER 30 PER CENT in favor of THE DUNCAN. The amount SAVED OVER THE FRUE being sufficient to PAY THE ENTIRE COST of the machines EVERY MONTH OF THE YEAR. One of its MOST VALUABLE features is as an AMALGAMATOR. It saves all THE AMALGAM GOLD and SILVER that ESCAPES the BATTERIES, PANS or SETTLERS, making the machine worth MORE than ITS COST for THIS PURPOSE ALONE.



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Possessing all the requirements of a first-class hoist, and affording means for the continuous operation of a Pump or Blower, without interfering with a hoisting apparatus. It is made entirely of iron, no piece weighs over 300 pounds. At the ordinary speed of a horse, a 1,000-pound bucket of ore may be raised 120 feet per minute. The hoisting-drum is under the complete control of the man of the shaft, and is capable of carrying 500 feet of five-eighths steel rope. SEND FOR CIRCULAR.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JUNE 27, 1885.

VOLUME L. Number 26.

Injectors for Feeding Boilers.

The uniform feeding of water to boilers is an important economical factor in their use, and we present in the accompanying cuts illustrations of two superior forms of injectors manufactured by Messrs. James Jinks & Co., of Detroit, Michigan, who have constituted the Joshua Henry Machine Works of Nos. 39 to 51 Fremont street, this city, their agents for their sale in these Pacific States.

The "Union" Injector, which the manufacturers have recently devised and introduced, is a simple and effective one-lever machine. One movement starts and stops the machine. There is nothing about it to get out of order, while the simplicity of it is such that any one can operate it. As a lifting injector it works equally well while taking water under pressure. It requires no adjustment for varying pressures of steam, and for simplicity, ease in operating, reliability and effectiveness the makers claim it has no equal.

The Duplex Injector is the name that was decided upon as best expressing the operation of this injector. It is a combination of two injectors, the operation of one depending on the operation of the other, and so adjusted that one governs the other in such a manner that it requires no special adjustment for varying pressures, hot or cold water, water under pressure or suction. It is one of the best appliances known for feeding boilers, as it always delivers the water hot to the boiler, and all the steam used in operating it is returned to the boiler, there being no loss of pressure or heat except by radiation, and if pipes are covered, practically no loss whatever.

There are no movable parts for adjustment, no valves to wear, so as to impair the working of the injector, and is not liable to get out of order. It is superior in design, material and workmanship, as it is made with the most improved machinery and tools, so as to duplicate each size perfectly in each particular part.

These machines will lift water 25 feet and force it into the boiler. They will put water into the boiler varying in temperature up to 185 degrees of heat, according to amount of steam pressure carried. Water can be drawn from it for any purpose without interrupting the feed.

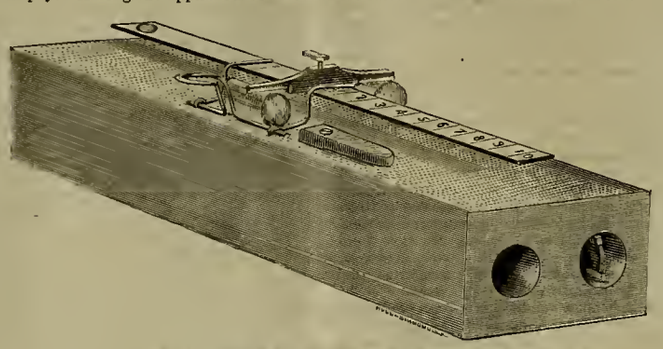
The "Duplex" can be started when hot, a fact which those that are versed in injectors will admit as a decided advantage. It is not necessary to cool this machine before starting, it is always ready. The Duplex Injector is manufactured under the only patent upon which a lifting injector can be constructed.

The constantly increasing sales of both the "Union" and the "Duplex," and the testimonials which are at hand confirming their effectiveness and reliability, are guarantees of their superior features. They will be found useful in the operation of stationary, marine, or any other form of boilers, and the agents assure us that their operation is well worthy of study by users of boilers as a safeguard against danger, and from the standpoint of economy.

THE Supervisors of Cochise county, A. T., voted $600 to send a representative to Washington to place the Indian question properly before the President, but an injunction was issued against the payment of the warrant.

A Prospector's Balance.

Mr. Melville Attwood, of this city, a gentleman who has all his life been connected with the mining interests in a practical way, has devised a simple working test for gold ores by which, with the aid of certain simple appliances, he is enabled to tell to a nicety what an ore will pay. Among the appliances connected with this test is a prospector's balance, an engraving of which is shown on this page. Mr. Attwood in giving a description of the balance says:



ATTWOOD'S BLOWPIPE AND PROSPECTORS' BALANCE.

Amongst the many difficulties I had to encounter in making the working test was first getting the rock properly and rapidly crushed, and afterward the gold washed out of the crushed rock and amalgamated without loss of gold. Messrs. Taylor's hand crusher I found answered very well for the crushing, and the improved form of hatea for washing out and amalgamating the gold in, but to complete the outfit I required a portable, accurate and cheap balance. After many attempts, in which I was kindly assisted by M. G. Rockwell and M. Bohn, I have at last succeeded in making a balance which I think will answer the purpose so well that Messrs. Taylor are now making one something after the same pattern, but with improvements.

The balance and frame, as shown by the accompanying drawing, is about seven inches long and one and a half wide, and one inch deep. The balance is a German silver beam, six inches long and one-fourth of an inch wide, the fulcrum knife edged and the bearings pieces of round glass.

On the right hand side of the fulcrum ten divisions are marked at equal distances from each other, and on the left hand side a small depression is made to receive the globules of metal or a small pan for gold dust. Above the fulcrum is a small vane, which being turned to the right or left adjusts the beam to equilibrium.

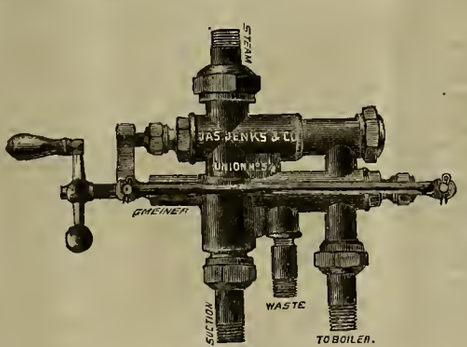
The two small wires resting upon the beam keep it in place while the globules to be weighed are being placed on the beam. By a very slight pressure with the finger, the wires are raised and allow the beam to work.

The number of weights required are three, made of flattened wire, viz., 10 grains, 1 grain and one-tenth of a grain. The weights are moved from one division to another as required to balance the globules, keeping the flat side on the lines of division. This balance is very sensitive and will weigh to the one-thousandth part of a grain.

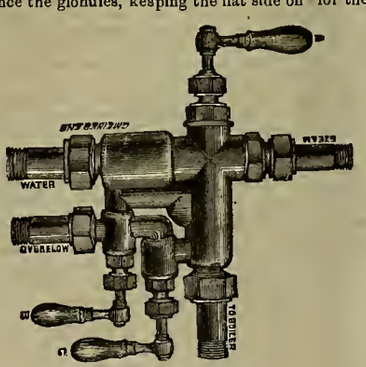
Holes are made in the wooden block to hold the blowpipes, pincettes, weights, charcoal, etc. The following table is to be used in connection with the balance:

Prospectors' and miners' gold table to determine free gold per ton of 2,000 pounds average. Sample for working test, four pound average = 28,000 grains:

Weight of Washed Gold; 4 lb. Sample in grains and tenths.....	Fineness, 780; value per oz., $16.12.	Fineness, 830; value per oz., $17.15.	Fineness, 875; value per oz., $18 08.	Fineness, 920; value per oz., $19 01.
5 grains	$83.97	$89.36	$94.20	$99.05
4 "	67.18	71.49	75.36	79.24
3 "	50.38	53.61	56.52	59.43
2 "	33.59	35.74	37.68	39.62
1 "	16.79	17.87	18.84	19.81
.9 "	15.11	16.08	16.96	17.82
.8 "	13.43	14.29	15.07	15.84
.7 "	11.75	12.51	13.19	13.86
.6 "	10.07	10.73	11.30	11.88
.5 "	8.40	8.93	9.42	9.90
.4 "	6.71	7.14	7.53	7.92
.3 "	5.03	5.36	5.65	5.94
.2 "	3.36	3.57	3.76	3.96
.1 "	1.68	1.78	1.88	1.98



UNION INJECTOR.



DUPLEX INJECTOR.

Our Increasing Population.

During the past few years the population of California has been steadily and rapidly increasing. Last week nearly 1,000 immigrants came into the State. This influx of new residents cannot help being of the greatest benefit to us in every way. Large tracts of land are being cut up into smaller holdings, and these are being properly cultivated by the new arrivals. The immigrants are mainly of the industrial classes, and they come from all quarters of the Union and from abroad. This revival of immigration has mainly been brought about by the active efforts of the State Immigration Association, which has been for some time engaged in disseminating information concerning the State and its advantages. People have been leaving colder climes for a more favored one, and are coming to a comparatively new State where land is rich and plenty, and where there is good opportunity to grow up with the country.

Few people have any idea of the amount of money brought to the State by these immigrants, nearly all of whom have more or less ready capital with which to start life in their new home. The secretary of the Immigration Association, Mr. Street, who is in a position to estimate pretty closely, calculates that the number of immigrants has amounted to 4,000 for the last three months, making a total of 12,000 for the quarter. The capital brought, he believes, certainly averaged $1,000 per immigrant. Therefore the addition made to the wealth of the State during April, May and June was, in his opinion, about $12,000,000. This money has been mostly laid out in building homes, buying stock and such necessary expenses. It has, therefore, been spread over the length and breadth of the State, and after the first crop has been garnered will make itself felt in this city. The locations chosen by the immigrants are in almost every county in the State. A large number have been lately going to San Diego county, where the prospect of the completion of the Atlantic and Pacific Railroad has caused much enthusiasm. Los Angeles and San Bernardino had their share of settlers, while a few enterprising men have located along the coast of Santa Barbara and Ventura. A great many immigrants have gone to San Luis Obispo and Monterey, Southern Monterey having been a particularly favorite locality. Many have settled in the northern counties, Lake and Mendocino, making large additions to the population. Shasta, Sierra and Trinity have also been receiving many new residents, and the whole State is rapidly filling up with a very desirable class of people.

THE car of the United States Fish Commission reached Portland yesterday with 10,000 hard-shell clams from Tacoma. These are a variety unknown on the Atlantic. They are packed in sand from their native beds, covered with seaweed, which is watered twice a day with salt water. They are to be planted at Wood's Holl, Mass.

CHARLES A. BUDDENSIEK, the builder, whose row of buildings on West Sixty-second street, New York, fell in a heap on April 13th and caused the death of Louis Walters, and who was recently convicted of manslaughter in the second degree, was sentenced to ten years' imprisonment and to pay a fine of $500.

Minerals in Amador County.

From an article hy Henry Wolgamuth in the Amador *Dispatch* we make the following extracts

Granite is found in all parts of the Sisrra and Coast range. The quarries of Folsom are known to every Californian; but it is of the finer kind I intend to write. The Penryn granite is a hrownish-colored, fine-grained stone which takes a high polish, and is therefore counted with the marbles. Another kind has heen found in the foothills of Placer county, which is white and of a grain sufficiently fine to he carved in ornaments. It is this kind that is now extensively used in the construction of the larger and more ornamsntal buildings in San Francisco. There is a quarry three miles southwest of Pine Grove, also at New York Ranch, which contains a white, fine-grained granite, which, when quarried and sent to San Francisco would find a ready market. There is a ledge of white granite on Sutter creek, helow the lime kiln, but it cannot bs shipped before a good wagon road is huilt.

Sandstone.

One of the most demanded stones at present in the construction of buildings is a sandstone of a good color, and such a texture that it does not rot. The grain should he fine so it can he carved in ornaments. Such a ledge of such extent as to last for years, would hring the discoverer a snug fortune. I am told that there is sandstone around Plymouth, hut I cannot judge of it as I have never seen it. In the vicinity of Michigan Bar there was worked a white sandstone some 30 years ago, but that stuff is worthless, as the many monuments rotting in the cemeteries proves. But still I thiuk there may be found in the lower foothills a stone having all the qualities necessary in a suitahle building stone.

Talc or Soapstone.

Nearly every miner knows this mineral and its fire-proof propsrties. Until now, few had thoughts of its heing sawed and worked up in chimneys or fireplaces instead of importing fire bricks. There is a new industry waiting for a man who has sufficient hrains to carry out this problem. There are in Europe fireplaces several hundred years old, which are constucted of talc. The dark kiuds are the most durahle for that purpose. There is another kiud I will write about, that, till now, has heen found only in New Jersey, and which is sold to every part of the civilized world where there is a mill to manufacture paper. This kind of talc is slaty; it must divide in thin leaves or flakes, the thinner or finer it splits the hetter it is for mixing with paper pulp. It should he snow-white or scarcely perceptibly hluish.

I think this mineral can he found hetween the Cosumnes and Mokelumne rivers, and east of the town of Sutter Creek. When and where there is a ledge or cliff of light or white talc, or soapstone, there is sometimes on both sides a fatty clay. That slaty stuff will, by reason of its construction, rot quicker, and to a finer mass, than the more compact masses of talcstons. The rains will wash the surface ground down, hy which an originally white stuff will he soiled and colored a great deal, hut hy throwing the top aside, and digging for it as a miner does for a quartz ledge, perhaps a good paying ledge may he discovered. For the best snow-white talc $400 a ton is paid; government price per acre, $2,000. In my travels from Oleta to Volcano I observed several such ledges, but as it was not my profession or trade I paid no attention to it. But I expose it now; perhaps some one may remember such a stuff, and I should he glad if my advice has put money in his pocket. Other clays, porcelain earth, haryta, graphite or plumbago, I shall reserve for other times.

Magnesia

Is a mineral which is used in many ways in the arts and sciences; in chemical works to prepars the several kinds of chlorides, hut principally in the manufacture of steel. Magnesia is a half-metal, and is generally a reddish hown, sometimes hlack, and occasionally dark purple. In the fracture it resembles glass; is heavy like iron, so that many think it is an iron ore. Some magnesia is found in connection with iron. In Volcano it is found in rodales of irregular form, mostly roundish with a smooth shiny surface, in houlders of two feet in diameter to ths size of a pea, often hollow inside. This has little commercial value, but if found in ledges of a foot and more, and of sufficient length, depth and width, it will pay to investigate if there is anything in it. With two per cent of tin it will make the discoverer a rich man. Magnesia ore is much used in preparing Bessemer's steel. The ore is first purified and melted; foundry men call it then spiegel eisen. The hest comes from Westfalia, North Germany. Magnesia ore has a value according to the percentage of metal. Ore of 60 per cent is worth $50 per ton. Magnesia ore sometimes contains iron, tin, zinc, and osmisum. Magnesia ore should always be given to a mineralogist who is also a good chemist. This mineral is mostly found east of the town of Sutter Creek, near limestone formations.

Diatomite, or Polishing Stone.

I found near the limestone a mineral, stone and earth, which marhle-cutters call "hone and polishing putty." Diatomite is used for polishing marhle and other minerals or metals. In the fracture it looks like a fine sandstone. When smooth it is either grayish grsen or yellowish green, with minute points of a darker color spotted. When of even grain it will make the hest whetstone, and the finer kinds are used for sharpening razors or for polishing gold or silver. The form of ths stone is lentil or sparoidal, some round, some oval, hut always flat, and in size from a walnut to three feet in diameter. This mineral is found as a stratum hetween clay-slate. The earth surrounding the stones contain a salt, which, mixed with the acids used in polishing marble, does the work in half the time, and gives the surface a hetter gloss or shine.

Placers and Water Rights.

A decision has heen rendered hy the Acting Secretary of the Interior which will interest miners. It is in the matter of the appeal of Rohert S. Hale from a decision of the Commissioner of the General Land Office holding for cancellation his numerical entry in Jefferson county, Helena district, Montana, declining to revoke the former decision. The Secretary says:

It appears that appellant seeks to procure patent to such claim solely upon the hasis of a mere water right, consisting of two large and several smaller reservoirs, made hy dammiug the outlets of natural lakes or hasins which are connected hy an aqueduct or ditch alleged to he some twenty-five miles in length; and that the aggregate cost of the same, together with two cahins, was $20,300. This seems to have been constructed for the sole purpose of conducting the water power thus stored to distant placer claims situated in another township.

It is true that the field notes state that the improvements, which consist of the said reservoirs, were constructed for placer mining purposes, hut it nowhere appears, nor is it even so much alleged, that they were constructed for the requisite purpose of developing the particular claim in question.

The most important feature of the proofs required hy your office regulations under the mining laws, is that touching the mineral value of the particular tract claimed, together with that showing lahor performed, or improvements made either hy the claimant or his grantors to develop the claim. Now ths proof furnished in the premiscs is so exceedingly meager as to he virtually incompetent or insufficient.

There is not a scintilla of proof establishing the existence of mineral within the claim in question. Indeed, the only allusion to such existence is contained in the claimant's own affidavit, and that of one Benjamin F. Marsh, U. S. Dsputy Surveyor, who states that he has heen informed and believes that a placer deposit of gold exists along the hed of the streams delineated upon the official plat of survey. But he also states that no placer mining work has heen done upon said claim, the aforesaid reservoirs, which are the only improvements thereon, having heen constructed hy the applicant at great cost, for the sole purpose of conducting water to placer mines situate in another township.

It is true that applicant's attorney filed two affidavits in yonr office on or ahout January 23, 1883, in support of his motion for reconsideration of the aforesaid decision of Novemher 16, 1882, alleging that some portion of the claim in question might he profitahly worked for mineral; hut their allegations are hased upon prospecting done in the years 1872 and 1875 and do not show that the claim was at the date of the affidavits, or that it ever had heen worked as placer ground, either hy the claimant or his grantors, I therefore concur in the opinion that the patent is not actually sought for a placer claim, hut for a water right, and that it is not competent to issue such a patent. See Chessman Placer Claim, 10 L. O., 322. I accordingly affirm said decisions.

PROPOSED SMELTER AT HELENA.—The committee appointed to interview the husiness and mining men upon the advisability and to solicit suhscriptions for the proposed new smelter, are still hard at work, and although the work seems to he progressing slowly the ultimate success of the enterprise seems to be an assured fact, and as soon as two promiuent mining men return from the East, who have gone there partially for the purpose of talking smelter to some Eastern capitalists, the entire matter, if Helena will do her share toward raisiug the required amount, will finally he favorahly terminated. The business men here seem to he more favorahly inclined to help the project along than do the realestate men. Why the real estate men seem to he thus standing in their own light no one seems to understand. A smelter or smelters in Helena is acknowledged hy them to be a good thing and yet they won't subscribe and are depending upon poor men who own mines and have scarcely money enough to huy their "grub" and tools, to do the building. They don't stop to think that these are the men that should he helped along and the men that generally help a town or city. If you give them an opportunity of selling their ores they will all have money and Helena will reap the reward. If you don't help them along, you will always have a lot of hroken miners on your hands and the business of this community will have to look—well, we don't know where for its reward. Let the matter have its just consideration and we feel satisfied that you will contribute liherally. *Helena Independent.*

Mining Management.

The numerous letters addressed us lately show plainly enough the management of gold mining companies for several years past has heen lax in the extreme. Fat appoiutments of chairmanships have led to jealousy among aspiring directors and those who want to attain the position, and all kinds of manœuvres and ungentlemanly proceedings have heen adopted to oust one set of occupants for others equally incompetent to jump into their places. Experts who havs heen engaged to report on the prospects of mines or to act as consulting engineers, if their reports havs heen unfavorable, from the vendors, directors or shareholders' point of view, whose hopes are to hear their properties praised, whether dessrving or not, are treated with scant courtesy, or prohably dismissed from their appointments, and sometimes without payment for services. Directors and shareholders in England who canuot be expected to understand the details or nature of gold mining, should he guided by the advice of experienced men whom they engage, and not ignore their advice merely hecause it is not in accord with their own ideas or wishes. The letters of Mr. Cornish on the West African gold mines, and those of Mr. Kitto on the Spanish gold mines, go to prove what difficulties and opposition heset the path of mining experts, who, having had a long training in practical gold mining, give straightforward and honest advics as to the value of properties, or how to conduct mining operations, are almost certain of giving offeuse to certaiu interested parties who appear to dssire their mining reports served hot and spicy, and flavored according to the taste of their employers. It is surprising to think that ordinary shrewd business men should on entering into gold mining ignore the first principles which guide their conduct in their own private affairs. The manufacturers of woolen goods would not engage an iron-worker to manage their business, nor would the ironmaster employ one accustomed to the making of silk or woolen textures, to take charge of iron works. Yet when the business of gold mining is undertaken almost any one is supposed by some people to hs qualified for conducting the works and directing the geueral management. The consequence has heen that many unqualified and wholly incompetent persons bave heen sent ahroad to conduct mining operations, that in many cases these so-called managers have gone out to the mines unprovided with money or material, and have heen expected to carry out important works and rsalize great results without efficient plant or material to work with. Direc ors and sbareholders have heen deceived hy extravagant statements made hy enthusiastic amateurs, who have in too many cases allowed their imagination to run wild with excitement at seeing a few specks of gold in a piece of quartz, and having had no practical knowledge of mining themselves, they imagined the whole bodies of quartz would average the same quality as a few picked specimens. Reports were made on assays of samples, and minute calculations made of possible profits on imaginary results, which, like many other visionary dreams, became rudely dispelled on practical demonstration of facts hy the hest of all tests, the operating on a quantity of matrix. We know of a case on the west coast of Africa, where a mining manager was sent ont to take charge of the management of a mining company, and to erect heavy machinery hefore the mine had heen opened in any way, and who had hut £5 when he landed, and no definite arrangements made for giving him credit or supplying him with the necessary funds to enable him to carry ont his work. Of course the manager was himself much to hlame for going out on such a wild goose chase. He may he a very good working miner; hut he was evidently a bad husiness manager to undertake such duties without making himself acquainted with the pecuniary position of the company, and taking care to he provided wi h funds to pay enrrent wages and expenses amongst the natives on the coast. The mining manager, who undertakes the responsihility of carrying on mining operations abroad and to erect machinery, should not only be competent for his work as a minor and engineer, hut as a business man should carefully calculate his ways and means, and take good care not to start hefore he is ready, nor trust to the tender mercies of an impecuuious company or hard-hearted directors, who would leave their managers to starve or die upon an inhospitahle coast, while loudly crying out for more "planks and money." In this case the company had a nominal capital of over £70,000, and while they could find a capital to pay the vendors a hig price for comparatively untried and, therefore, worthless property, with no shaft sunk or lode proved, nor even a title property secured, the directors could not find funds to enahle their manager to prospect the property; hut with the apparent object of making a show of doing something for their money they purchase and send out a large, expensive and useless plant and machinery without even funds to pay the duty on landing, much less to erect it. The company is in a morihund state; the manager had to get away from the port in a surreptitious way, leaving the poor natives in debt for wages, while the useless machinery is lying rusting on the grounnd, and disgrace and discredit rests upon all concerned.—*London Mining Journal.*

Stick to Your Business.

It is the great desire, expressed or unexpressed, of every human heing to succeed in life, and to secure success nothing is more important than that a person should have a continuity of purpose—a fixed aim of life. When once, after careful thought and study, a young man makes up his mind to follow a certain line of business or effort, when his heart and hrain are in perfect accord, there need hs no fear of results if he will only stick to his purposs.

The great difficulty lies in the wavering disposition of young men. The world presents a great and varied held for effort. It is too often the case, where success is not realized at once, that a young man seeing others around him grasping the prize in other directions of efforts becomes impatient at his apparent failure, throws up what he has actually gaiued, with the determination to start anew in what may appear to him a more favorable dirsction. Instances liks the following are of every-day occurrence:

There is a diligent mechanic; he has made fair hut slow progress in huilding up his husiness. He sees a hard-working farmer near hy, who is growing rapidly rich hy large crops of fruit or grain. He resolves to forsake his shop and tools, sells out, and huys a farm. It is not surprising that he makes fatal mistakes in a business to which he is neither adopted nor educated. His crops fail and he loses all. The reverse is quite as often seen.

Then again there are those who wish for ths good things of life, who desirs success, hut in an aimless, listless sort of way, which never can succeed. They sit listlessly ahout and envy those who are meetiug with success, hemoaning their own had luck and attrihuting to some mystsrious power or fortune the success of others, which really comes only from careful study, iutslligent and hard lahor, and ths great motive power of all successful effort—the will.

Mark the unsuccessful men in any community—the men who never get ahead, and you will find that they all helong to the one class or the other to which we have ahove alluded. Either they never stick to one business long enough to find what there is in it, or they are of that lazy, listless kind who never work except when circumstances compel them iu that direction.

The frequent changes from one employment to another is one of the most common errors of life, and to it can he traced a great majority of busiuess failures. There are cases, it is true, where men bscoms disappointed in business, and meet with success hy changing the same; hut in nine cases out of ten greatsr success would have been achieved hy sticking to the first effort.

It is seldom that life success is achieved unless the purpose and aim of the man is carefully and deliherately formed at the outset and steadfastly adhered to throughout all the succeeding years of life. His life purpose must hs made to shine out hefore him like a heacon light in the far distant future, toward which he must press with a fixed purpose, turning neither to the left nor right till he reaches the haven of success.

Such a life purpose will grow and develop nntil all else hecomes suhservient to it. All we need to lead us to success is tne will to do, the physical strength to carry out that will, and confidence in ourselves. Let othsrs make or mar their lives as they will, hut let it be our effort to hold firmly to a continuity of the purpose we have carefully formed and success will surely crown our efforts in the end.

The Idaho Silver Convention.

The Wood River mining and Industrial Association held a meeting in this city, which was quite numerously attended.

Mr. Havens, from the committee on freight rates, recommended concerted action to increase the ore tonnage and secure lower rates.

Ths committee on sampling reported the lowest rate east of Utah for such work to he 75 cents per ton for whole samples. West of Colorado no sampling is done for less than $2 per ton for half samples. Where the sampler crushes the ore, 50 cents extra is charged per ton.

The meeting resolved that it is the sense of the association that ores should not be taxed, and James H. Beatty, V. S. Anderson and George A. Black were appointed a committee to confer with the county officials on this question.

G. L. Havens, E. B. Trne and Isaac Whisler were appointed a committee to confer with the county commissioners in relation to the opening of roads to the different mining sections of the county.

The association indorsed the resolutions adopted by the convention of silver miners held at Denver, Colorado, last winter, which demand the unlimited coinage of gold and silver, and call for the enactment of laws to enforce such coinage; also, calling upon Congress to retire all one and two-dollar hills from circulation.

E. A. Wall, W. H. Watt, W. H. Pettit, Geo. A. Shoup and other prominent mining men of Idaho were appointed a committee to issue a call for a Territorial Silver Convention, to he held at Hailey.

The association adjourned until Wednesday, July 1, 1885.—*Hailey Times.*

MECHANICAL PROGRESS.

What American Inventors Have Done for the Locomotive.

Take a standard eight-wheel engine, good for almost any kind of service. The high pressure, high speed engine itself, so simple and efficient, is the invention of Oliver Evans; the multi-tubular boiler, so essential to rapid steam making, and without which no train could have been kept running more than ten miles an hour, was invented by Nathan Read, an American. It is carried in compact form by four coupled driving wheels and a four-wheel truck, a combination patented in 1836 by Henry R. Campbell, of Philadelphia, the truck having been previously invented by John B. Jervis, of Rome, N. Y. The driving wheels, of cast iron, made made hollow, are the invention of Thomas Rogers, of Paterson, N. J., who was also among the first to use weights secured in the wheels to counterbalance the momentum of the reciprocating parts. Allen paper wheels—a thoroughly Yankee notion—carry the engine truck, and the tender is sustained by cast iron wheels with chilled thread, first invented by Ross Winans, of Baltimore. The single bar frame, holding cylinders placed horizontally and bolted together in the center, is another remarkably strong and compact combination, designed in part by Winans, but put in its present shape by William Mason, of Taunton, Mass. All the pipes and joint connections are secured against leakage by the ground joint, invented by M. W. Baldwin, of Philadelphia. This water pump gets a steady action and is secured from breakage by the air chamber invented by Walter McQueen, of Schenectady. Expansion braces, first brought out by Rogers, give the fire-box a secure hold on the frame, yet permits the boiler to lengthen or shorten, as change of temperature requires. The weight of the engine is distributed evenly to the axle boxes by means of equalizing levers, invented in 1837 by Joseph Harrison, of Philadelphia. Two fixed eccentrics, invented by William T. James of New York, give movement to an Allen slide valve, balanced by a Richardson device. Spark-throwing is restrained by an extended smoke-box combination, invented by John Thompson, of the Boston & Main railroad. Combustion is admirably promoted, and smoke-making prevented by the Buchanan design of fire-box, which is constructed of mild steel, first made successful for that purpose by the Baldwin Locomotive Works. The engineer and fireman sit comfortably in a convenient cab, first applied by David Matthew, but since improved by every builder in the country. As the locomotive thunders along through the blackness of midnight over giddy chasms spanned by traceries of steel, over the dangerous grades of mountain scenery or through the sameness of western plains, the engineer sits calm and steadfast, secure in the knowledge that engine and train are perfectly under his command. This entire confidence is begotten of the knowledge that a turn of his hand would grasp every wheel in the train between vise-like brakes shoes, applied by that greatest life saver of modern times, the Westinghouse automatic air brake, one of the most valuable parts that the American inventor has added to railroad machinery.—*Angus Sinclair.*

Steel Against Iron.

William F. Zimmerman, of the Pittsburg testing laboratory, has completed for the Detroit Dry Dock Company a test of the steel plates which will enter into the construction of the new steamer for the Detroit & Cleveland Steam Navigation Company. The average tensile strength of the plates is 60,000 pounds to the square inch. This soft steel is of such remarkable elasticity that a piece of plate may be stretched one-half longer than its usual size without parting. The Detroit Dry Dock Company recently made some experiments of its own with the soft steel used in the construction of the new steamer *Mascotte* at its yards in Wyandotte. They were made both with soft steel and the best quality of iron used in the construction of iron ships. Strips of cold steel plate, 3-16 of an inch thick, and ¾ of an inch wide were twisted like an augur in a lathe, and even so far that they doubled without cracking or causing a single abrasion of the metal's surface. Angle irons were flattened cold and bent in like manner. Another strip was bent repeatedly without causing it to break or even flaw. In the presence of the owners of the *Mascotte* a large ball weighing 950 pounds was suspended at a height of 35 feet and allowed to drop on a 3-16 plate, bulging it about 20 inches into the ground without breaking it. The ball was then dropped on the reverse side of the plate, and this repeated five times without breaking the plate. The same test was made with a one-half-inch iron plate, and it was broken the first time. These tests are regarded as furnishing a conclusive demonstration of the comparative merits of soft steel and iron for resisting sudden shocks, and consequently of their respective merits as materials for the construction of modern ships.

GLASS COMPOSITION—A NEW ALLOY.—A new alloy, known in Germany under the name "glass composition," and placed in the market by Mr. Louis Dill, of Frankfurt-am-Main, is reported to have found extensive application in that country. It is said to possess the qualities of the best composition used for bearing surfaces. It contains a certain percentage of a vitreous substance, which, expressed in figures, is very trifling, but is stated to be sufficient to impart to the alloy a durability and uniformity not hitherto reached. Even at a high rate of speed the heating of journals is said to be avoided, and their unequal wear prevented. Moreover, the first cost of the composition is reported to be less than that of alloys of equal efficiency at present in use; and it is finally said to stand wear and tear remarkably well, even with a small amount of lubrication, and to be proof against atmospheric influences and the action of diluted acids. This is certainly a very promising invention, but the admixture of glass would, we should have imagined, have acted prejudicially on the bearings. But we live in an age of surprises.

Journals and Bearings.

When allowance for oil space is made, says a contemporary, the fitting should be as carefully made as though the ons surfaces was to be driven on the other. That is, the bearing should be cylindrical as well as the journal. The surface should be fitted up with a scraper, where the bearings are large, and brought to a uniform fit. Fitting so that the journal is a true cylinder, while the bearing is bored a double cone-shape, or elliptical in cross section, would never do. The journal would press through the oil at the high place on the small parts of the cone, and here would be abrasion. But by the use of a scraper or file, or both, after the lathe work is done, the bearing and journal may be brought to a near fit, so that the needed film of oil will have a uniformity of thickness along any line lengthwise, and be but slightly crescent-shaped with true circle outlines in cross sections through the bearings. Such a bearing will be expected to run cool, while the bearings, which "will soon wear to fit," will not run cool. In the latter, a cool bearing, seems never to be possible, because at first wear is expected in place of scraping, to reduce the points to be worn off, and such wear requires contact of bearing and journal. That contact will injure the journal, making it rough, which in turn will cut the bearing unduly. Now, by the time some degree of evenness is supposed to be gained there will be too much space for the oil. The shaft will then tumble about, knocking against the bearing with such force as to cause metal contact and rubbing. Both of these actions produce heat as well as continue in aggravation the cause of that heat. In short, in order that machinery bearings and journals shall be correct they must be made right. The "wear to fit" is utterly out of the question in first class work; that is to say, fine journals and bearings do not grow like weeds, but must be the result of skill and good judgment, as well as other things.

NEW METHOD OF MELTING IRON.—A new method of melting iron has been devised in Germany. The cupola is supplied with blast through two tuyeres, one above the other, there being eighteen in each set; the tuyeres are ports, with the form of a vertical slat, are directly connected with a tuyere ring. The particular feature of the cupola is that the bottom is a slightly inverted arch, which is pierced by two openings, through which both blasts, or rather imperfectly consumed gases of combustion, and the fluid iron can flow. Below is a small chamber in which the iron collects; it is heated by the gases forced downward from ths cupola above, these being supplied with the necessary air for combustion by a special tuyere leading from the main blast pipe—ths chamber at the same time serving to preheat scrap, etc., which need only to be pushed into the bath for dissolving it. Of course, considerable quantities of scrap can be used by directly charging an ordinary cupola; but it is claimed in this case the advantages presented are economy of fuel and a greater facility for making sharp, strong castings and a purer description of metal.

IMPROVED METHOD.—A new method of manufacturing merchant iron from scrap iron is as follows: Upon the supporting board are placed two angle-irons, their upright parts projecting upward from the long edges of the board. Between these angle-irons the scraps are piled up and then the mass is placed into a furnace and is said to be ready for rolling after the application of a single heat. The object of the angle-irons is to form solid edges in the finished iron, a result that could not be accomplished by the old method without double heating. For rectangular bar iron two additional angle-irons should be placed upon the upper edges of the pile. This process has been patented by G. Westerman, Sr., of Lockport, N. Y.

CELLULAR STRUCTURE OF MELTED STEEL.—Microscopical examination shows that molten steel possesses a kind of cellular tissue, the iron forming the nucleus and the carbon the envelope of the cellules. These simple cellules form agglomerations which the authors term compound cells. These latter cells may be easily identified with what is ordinarily called the grain of the steel; their surfaces are therefore regions of least cohesion. Hence the fraction of a bar of steel is the surface which contains a minimum of carbon.

SCIENTIFIC PROGRESS.

How Dew is Produced.

When, in consequence of radiation, objects near the earth's surface, such as grass and leaves of vegetables, become cooled below the dew point in their vicinity, they condense upon themselves a portion of the vapor which is present in the air, and this is called dew. The amount of dew thus deposited is greatest upon those substances whose temperature is the lowest, being proportional to the amount of depression of their temperature below that of the dew point. Dew, therefore, does not fall from the sky like drops of rain, but the vapor of the air is condensed by coming in contact with the cold surface of the object upon which the dew collects. The collection of moisture on the outside of a pitcher of cold water on a hot day is precisely analogous to the formation of dew. In some parts of Egypt and Arabia nearly all the moisture the earth receives is that obtained from dew. The circumstance most favorable for the production of dew is cloudless nights and full exposure to the sky, an almost tranquil and moist atmosphere. The deposition of dew is immediately checked by clouds, which reflect back to the earth the heat radiated from it. The same effect is produced by an artificial covering, even though of thinnest texture, from which cause plants placed beneath trees or near buildings collect less dew than those fully exposed to a cloudless sky.

A slight breeze, by renewing the air which has deposited its excess of vapor, makes the dew more abundant, but a fresh breeze, by agitation, produces a mingling of the air at different elevations, equalizing the temperature throughout, so the air at the earth's surface cannot become much colder than the superincumbent atmosphere. Little dew, if any at all, is deposited on windy nights. When the atmosphere is most humid, a given reduction of temperature will sooner reach the dew point, at which the deposition of moisture begins. An abundant dew is regarded as an indication of approaching rain, because it proves that the air contains a large quantity of vapor.

Dew is not deposited on the surface of large bodies of water whose temperature is above 40 degrees, for as soon as the particles at the surface are cooled they become heavier and sink, while warmer and lighter particles rise to the top, by which means the surface of the water is maintained at nearly the same temperature as the surrounding air. In the midst of sandy deserts, on account of the dryness of the air, dew is almost unknown. Travelers upon the deserts of Africa and Asia are notified of their proximity to lakes or rivers by the appearance of dew. But little dew is deposited in cities, because most of the objects there found are stronger power radiators than the leaves of vegetables, and because the heat of the city is always greater than that of the surrounding country.

The Formation of Frost.

Hoar-frost is formed under the same circumstances as dew, with the exception of a lower temperature. When the temperature of plants falls below 32 degrees the moisture of the air is condensed upon them in the solid state, and forms a layer of spongy ice. Hoar-frost is, therefore, not frozen dew, but the moisture of the air is deposited in the solid form, without having passed through the liquid condition. Hoar-frost, like dew, is deposited chiefly upon those bodies which radiate best, such as plants and the leaves of vegetables. Since plants sometimes become cooler by radiation from 12 to 15 degrees below the temperature of the air, a frost may occur although a thermometer a few feet above the ground does not sink to 32 degrees. During a clear and still night when a thermometer six feet above the ground sinks to 36 degrees a heavy frost may be expected, and a slight frost may occur when the same thermometer sinks only to 47 degrees. During cold nights of spring, plants which are sheltered by trees are less liable to be injured by frost than those which are fully exposed. A thin covering of straw will generally afford entire protection. A garden may frequently be saved from injury by kindling a fire, which will envelop the plants in a cloud of smoke. Fogs and clouds also protect vegetation from the effects of frost. Plants are often killed by frost in the valleys and up to a certain height upon the hills, while above this limit they entirely escape injury. It has been found by observation that a thermometer attached to a high tower in a valley indicates at night the same average temperature as a thermometer on the side of a hill upon the same level. This indicates that during tranquil nights cold air resulting from radiation at the surface of the earth settles in the valleys in consequence of its greater density, and the warm and cold air are arranged in nearly horizontal strata, like liquids of different densities.

MANUFACTURE OF OXYGEN.—MM. Brin, of Passy, are producing oxygen on rather a large scale by the barium oxide process. They have two large retort furnaces regularly going, filled with retorts of 2 80 meters length and 16 centimeters diameter. In these retorts they calcine oxide of barium, passing over it a stream of air which has passed through quicklime to free it of carbonic acid. During this calcination the heat does not exceed about 500° C., at which temperature the barium oxide absorbs oxygen, becoming peroxidized. The nitrogen is drawn off and passed into gasholders, to be used for making ammonia, etc. When the barium oxide has absorbed as much oxygen as it can, the heat is raised to about 800° C., at which temperature the peroxide is decomposed, giving up again the absorbed oxygen, which is drawn off and pumped into a gasholder. MM. Brin make use of the oxygen so collected in many ways, one being the application of it to the purification of water. Filtered water is placed in a cylinder, and saturated with oxygen gas at 300 pounds pressure to the inch. All organic matter is destroyed, and perfectly pure water results.

Resuscitating Fish.

Mr. W. O. Chambers, secretary of the National Fish Culture Association, of London, conducted lately an interesting experiment in resuscitating fish by the use of brandy, before a number of gentlemen at South Kensington:

Taking two carp from the tanks of the aquarium, he deposited them in separate dry cans. After a lapse of four hours the fish were replaced in water, evident signs of expiration being apparent in both cases. A small quantity of brandy and water was then given to one carp through the medium of a feather, and no sooner was the fish replaced in water than it assumed its normal condition, and seemed to be restored to vigor and strength. The other, to all appearances, died half an hour after its associate, and was taken out of the water and thrown on the ground. About four hours later, however, the fish was picked up by Mr. Chambers, who observed it to be *in rigor mortis*. He then at once operated on the seemingly inanimate fish by opening its mouth and pouring a dose of brandy and water down its throat, and again inserting it in the water, when, to his utter astonishment, he noticed slight signs of animation. For five minutes the object of the experiment floated helplessly on its side, when, to the astonishment of those who watched the experiment, it gradually made use of its fins—feebly at first, but afterward energetically. Both fishes, which show no signs of their late prostration, now swim about with their *confreres* as usual. Similar experiments were made on several other varieties of fish, all with similar results except salmon, with which the experiments utterly failed.

INCREASE OF THE EARTH'S MASS.—Dr. Kleiber, of St. Petersburgh, Prof. Schmidt, of Athens, Prof. Newton, of Yale College, and others have been taking careful observations of late and making estimates therefrom of the daily increase of the earth's mass from the falling upon it of meteors and cosmical dust. The result of the observations is that about 450,000 meteors fall upon the surface of the whole earth every hour, and that the average weight of these bodies is about five grains each, a total of 4,950 pounds per hour, or a fraction short of 60 tons every 24 hours.

That amount of material falling daily from celestial space is certainly no small increase to the earth's mass. The earth's attraction is considered responsible for 20 per cent of this material—the balance of 80 per cent would be increased each hour by a globe the size of the earth even if it had no attraction.

NORWEGIUM.—This is the name given to another new metal, which is now added to our rapidly growing list of elements. It was discovered by Dr. T. Dahll in examining a specimen of nickel ore from Kragero, in Norway. It is a malleable metal, of white color, with a tinge of brown; it presents, when pure, a metallic luster, but, on exposure to the atmosphere, becomes coated with a thin film of oxide; its hardness is about that of copper, and its specific gravity is 9·4441. At 350° C., it melts. From its physical properties and chemical reaction, it appears to differ from every other known metal, and Dr. Dahll claims for it a distinct individuality.

FEATHER FUR.—Fur made from feathers has been used for five or six years for the borders of ladies' cloaks, dresses, etc. Even sealskin cloaks have been imitated with this material. Though an imitation only, the article is in most respects quite as suitable and serviceable as the genuine fur. In some particulars it is even superior, as it may be torn into suitable strips without loss; another advantage is that it is light, pliant, insensible to pressure, and may even be treated with hot water without detriment to the fabric.

A SUB-MARINE BOAT FOR SCIENTIFIC PURPOSES.—From Nice, Italy, comes the information that, at that place, trial trips have been made with a sub-marine boat, designed by Toselli, which will probably be of great service to this naturalist. The boat can penetrate to the depth of about 250 metres, and as it is surrounded by powerful electric lamps, it is possible to subject the sea to minute inspection.

GOLD AND SILVER FERNS.—L. C. Doane says, in *The Microscope;* Upon a slip of glass put a drop of liquid auric chloride or argentic nitrate, with half a grain of metallic zinc in the auric chloride, and copper in the silver. A growth of exquisite gold and silver ferns will grow beneath the eye.

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MINING SUMMARY—From the various counties of California, Nevada, Arizona, Montana, New Mexico, Oregon and Utah, 416-17.

MINING STOCK MARKET.—Sales at the San Francisco Stock Board, Notices of Meetings, Assessments. Dividends and Bullion Shipments, 420.

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Axle Lubricant—James G. Allen, S. F.
Dividend Notice—San Francisco Savings Union.
Clear Lake and Calistoga Stage Line—D. Wellington.
See Advertising Columns.

Passing Events.

As we close the volume with this number, it is proper to call the attention of our readers to the very full index which is given on the last page, and to remind them that this is a proper time to renew their subscription.

There is not very much to report concerning the mining situation aside from what is chronicled in our mining summary. Work is being actively conducted in all quarters with seemingly satisfactory results.

The Bodie Tunnel has been started up again, which is an indication that the mine managers of Bodie are gradually getting the mining industry upon its legitimate basis.

The Austin miners' union has decided to disband, an action that was necessary in order to effect a reduction in the prices of wages. As the union was organized no other way could be used to bring about a reduction to $3.50 per day.

California gold mining continues prosperous, and more prospecting is being done than for many years previous. The water season has been very short this year, so that surface miners will not do as well as usual.

AN artesian well on a desert station in Kern county has been completed, which gives a flow of 1,575,000 gallons in 24 hours, and the water rises 11½ inches above the pipe. The cost was only $700.

Close of the Volume.

With this number is completed Vol. L. of the MINING AND SCIENTIFIC PRESS, which is the oldest publication of a technical nature on the Pacific Coast. When the PRESS was first started the mining industry was confined to comparatively narrow regions, and it has seen this industry gradually widen its field until it has assumed its present magnificent proportions. During all these years the PRESS has been a steady and earnest advocate of legitimate mining as opposed to mere stock gambling, and it has lived to see these principles recognized by all who have the interests of the country at heart. To-day mining is being conducted on a more practical basis than ever before.

It has been the object of the editors and publishers of this journal to collect for its columns everything that would be of interest or value to the classes it represents. Improvements in mining and metallurgy, inventions, mechanical appliances, processes—in fact everything of this kind has been described and commented on as it has came up. Current mining news and progress has been reported in a condensed and readable form in every number.

Everything of interest in mechanical and scientific progress, engineering, etc., has been noted and described. Correspondence from all quarters of the coast, and from most of the mining camps has been published; and our travelling representatives have been constantly on the move gathering the latest and freshest information and details concerning the prominent camps and mines.

The copious index on the last page of this number shows the scope of the subjects treated in the volume. Though mainly devoted to Pacific Coast interests, attention has been paid to much that is going on elsewhere in the Union and abroad. We have endeavored to keep pace with the march of improvement. This year we have moved to more commodious and better quarters, with new editorial and composing rooms, press and engine rooms, etc., and are now in better condition than ever before to advance the interest of our patrons. We shall continue to improve the PRESS, as it is the intention and desire to make it in every way the suitable representetive of the interests to which it is devoted.

The Mining Bureau and the Exposition.

State Mineralogist Henry G. Hanks has returned from the New Orleans Exposition, and the California minerals which were exhibited there have also arrived. As it is the intention of the Trustees to move the State Mining Bureau from its present quarters to the Pioneer Building on Fourth street near Market, which is now approaching completion, the minerals will not be taken from the packing boxes until the new rooms are ready to receive them. Much more commodious and convenient quarters are thus assured for the Bureau.

Mr. Hanks states that the mineral exhibit at New Orleans was very fine, but that of California was undoubtedly the best, and was greatly appreciated. He was invited to speak before some of the scientific societies there on the subject of Californie minerals, and took occasion to explain the workings of the California Mining Bureau. He states that steps are being taken now to establish a similar institution in Louisiana.

While absent Mr. Hanks visited the gold mines in Georgia, and will present a report of his observations to the Governor. He has also prepared an elaborate report on the mineral collections at New Orleans. Both of these reports will be published as soon as practicable.

Mr. Hanks states that great interest was manifested about California. He says, also, that Mr. and Mrs. J. G. Lemmon aided largely in behalf of California, and did good and efficient services which ought to be better appreciated than they have been in all quarters. Mrs. Lemmon had charge of a department of California women's work, in which much interest was shown. Mr. Lemmon wrote and spoke much concerning the State and its products. Taken altogether, Mr. Hanks is of the opinion that the part taken by Californie at the Exposition will greatly redound to the benefit of the State.

DURING May, 8,906 pension certificates were issued, which is the largest number, says the Washington *Star*, ever granted in one month since the organization of the office.

Cost of Mining.

In this State the mining of gold ores has been gradually reduced to such a system that the cost has greatly diminished from that of former years. Gold ore, worth no more than $5 per ton, is being profitably worked, and there is an abundance of this class of ore in the State. Of course the cost of mining varies with the locality, width of ledges, country rock, etc. Perhaps the Alabama mine, Tuolumne county, has been doing its work about as cheap as any. The ore only yields from $3.00 to $3.50 per ton, and contains one per cent of sulphurets, which are not saved. The cost of mining, including dead work, is only 40 cents per ton. In the 40-stamp mill, run by water-power, treating 80 tons per day, the mill treatment of the ore costs 70 cents per ton; total for mining and milling, $1.10 per ton. The mine is worked by open cut and tunnels, but no shaft.

Mr. W. A. Skidmore, the secretary of the Miners' Association, has the record of a representative low grade mine in this State, which shows the relative cost of different classes of mining rock in California. He does not care to give the name of the mine, but states that the country rock is granite, the ledge matter easily broken, the ledge of fair width, and the rates of labor $3 per day. The following tables show the costs and ratio of costs:

RATIO OF COSTS.—[Assume these items to cost 100.]

Items.	Tunnel. Feet.	Tunnel. Tons.	Levels. Feet.	Levels. Tons.	Winze. Feet.	Winze. Tons.	Winze levels. Feet.	Winze levels. Tons.	Raises. Feet.	Raises. Tons.	Cross cuts. Feet.	Cross cuts. Tons.	Stopes. Tons.
Tunnel.....	100	100	89	85	106	106	73	117	37	89	27	81	71
Levels.....	146	118	1 0	100	220	107	138	100	54	105	37	95	84
Winze.....	110	54	76	46	100	81	100	63	41	78	20	44	38
Raises.....	112	86	184	72	242	139	190	100	51	48	20	69	61
Winze Levels..	157	124	94	105	139	100	257	164	141	100	71	91	80
Cross-cuts.....	267	140	259	110	201	104	257	164	141	125	100	114	100
Stopes.....	376	124	259	110	201	104	257	164	141	125	100	114	100

STATEMENT OF COSTS.

Items.	Cost.	Cost per ton.	Cost per foot.	Number Tons of Feet.	Number Tons per foot.	Feet per ton.
Tunnel 7½ by 10, cross-cuts.....	$17,419 92	$19 77	$83 31	881	5.97	0.167
Levels 8 by 7½, opened through tunnel..	30,452 58	13 63	83 60	2,234	5.97	0.167
Winze 5 by 7½, opened through levels 8 by 7½, opened through tunnel..	1,347 68	14 48	3 86	93	3.75	0.267
Winze levels 5 by 6.....	6,213 00	7 40	2 95	839	2.52	0.397
Raises 5 by 6½.....	4,524 28	5 98	2 69	1,000	1.96	0.509
Cross-cuts 6 by 4½ in vein matter.....	9,588 38	.....	2 36	4,063	.....	.....

Selling Claims to Chinese.

The prejudice against the Chinese as a race is perhaps nowhere more marked in California than in the mining camps. In many camps organized of late years resolutions have been adopted against the admission of Chinese miners. And this not only in California, but in Oregon, Idaho, Montana, Arizona, and in fact in nearly all the mining regions. So much has this feeling been developed that many companies formerly employing them have considered it good policy to displace the coolie altogether. Nevertheless there are many still at work, though most of them are now at work for themselves. They are willing to work for much less than white men, and poor and abandoned grounds are known as "Chinese diggings." They do not often venture into quartz but stick to placers where they can work out a dollar or so a day with the old-fashioned implements. But even this is objected to by many, and there are serious complaints against selling placer ground to Chinese. A good many persons have been selling these placer claims to Chinese where they had no rights to the ground themselves. As a Forest City miner very pertinently says: "How these persons obtain or acquire the right to sell Government lands or give a title thereto, is a question which should be questioned and severely dealt with by the law, for it is evident that this practice works an injury to the many prospectors who are seeking for, and would be glad to obtain diggings where they could even make wages. The excuse of these parties is that the lands sold to the Chinese is of no intrinsic value, it having been worked out, etc." But it is a fact that many of the Chinese miners accumulate large sums on their claims. There is no way of finding out their earnings for they are very close-mouthed, and their dust all goes to China. It is certain that they take out of California soil many thousands yearly.

Action of Oil on Boilers.

On the 25th of May an explosion occurred at the tripe factory of John Bayle, at South San Francisco, by which the engineer named Serrot was injured so badly that he died, and four others were injured end taken to the hospital, but have since recovered.

In this factory three tanks were in use for extracting tallow from meat, etc.. The tanks were made of boiler iron and were 72 inches in diameter by about 11 feet long, having hemispherical ends, and in use were placed upright. They had two large openings or man-holes—one at the top, by which the tank was charged with meat, and the other near the bottom through which the meat was taken out after the tallow had been extracted. The manner of extracting was by putting meet into the tank then closing it up tight and admitting steam from an ordinary tubular boiler, and after the materials had been in contact with the steam eight hours to shut off the steam—from the boiler—then letting the remaining steam escape from the tank, to open it and take out the meat. The pressure of steam generally carried on the boiler for supplying the tank was 80 pounds, and in working the pressure in the tank was usually about ten pounds less, or 70 pounds, so that the tank was required to be strong enough to safely stand this pressure. The tank was made of iron three-eighths of an inch thick, and was, when new, safe for the pressure at which it was worked; but after having been in use some four or five years the iron was reduced to, in some parts, less than one-eighth of an inch. During one day, when the pressure was raised to 120 or more pounds on the boiler, the increased strain on this tank was too much for its decreased strength, and it exploded, with the result above mentioned. It seems that the acids contained in the animal fat have a very destructive action on iron, and this has become known to many engineers through the action upon the iron of steam engines which have been lubricated with lard and other animal oils, so that now engineers refrain from using animal oils to any extent when possible to avoid it. This subject has been brought into prominence by the action of the Association of Stationary Engineers, who appointed a committee to investigate the cause of the explosion that it might be denuded of all mystery in the eyes of the public; and that in view of the peril to which citizens are exposed by many dangerous boilers in this city which are under the care of incompetent persons, the Board of Supervisors might be induced to pass an ordinance requiring all steam boilers to be inspected, and that all persons having charge of such should be examined as to their qualifications for such responsible positions.

Too much care cannot be exercised in the care of steam boilers, and the Engineers' Association are entitled to the thanks of the community for their endeavors to promote the safety and security of those whose business and occupation bring them within the range of injury by explosions of steam boilers.

In this connection comes a question about the actions of various kinds of oils—whether animal or mineral on boiler iron, and as to the safety of admitting any kind of oil in a boiler used either in which to generate steam or in which steam is used under pressure.

It is now generally understood that the natural mineral oils have no injurious effects upon boilers, but experience in some cases has seemed to indicate that petroleum oils fasten themselves on the shell of boilers, forming a scale impenetrable to water; and when this has occurred over the fine surface boilers have been burned. This has seemed to be the case, but a careful observance of all grease or oil of any kind entering into a boiler, and patiently watching the action by our engineers, will do much toward throwing more light upon this interesting but not entirely well-understood subject.

BY the first of next month every iron and steel mill in Pittsburg and vicinity, with one exception, will be using natural gas for fuel. This will reduce the consumption of coal here 38,250,000 bushels per annum.

Material Progress in California.

The prospector is the pioneer of the mining industry, and the miner in his turn has on this coast been the pioneer who has opened up new regions for civilization and progress. He, in the progress of his work, builds roads, improves water-courses, starts towns, settles up the country, brings in his train the men who must feed, clothe and furnish him with necessities, and reclaims from solitude the tracts and regions which are in the end to support the growing population of the country. All this is particularly true of California. Most of the cities and towns of this State are the direct result of the miner's early labors. Their sites were selected for his convenience and they were established and came into being because of his wants. Some have disappeared because the miner deserted the locality, which others have contrived to grow and flourish because of the existence of a population which has displaced the miner of early days.

Agriculture and the mechanic arts have in this country followed the miner. They first come to assist him, and then, when his occupation is gone, they take the field he has left and grow in prosperity until almost the remembrance of their origin is forgotten.

Examples of this are to be seen on every hand in California. Old mining towns have been rehabilitated and an entirely different population substituted. The miner forms a very small proportion of the inhabitants, and even he has lost his nomadic habits and has become a settled-down citizen. Mechanics, citizens, tradesmen, manufacturers, merchants, farmers, horticulturists, professional men and similar classes make up the towns, which are now like those in older countries, having cast off the habits of early days.

Perhaps in no place are these changes more noticeable than in the northern part of California. The towns there are many of them as old as the State, and for years were mere mining camps. During the past decade they have emerged from the position of camp to that of town or city. Railroads run in every direction. Farms and orchards abound on all sides, and the towns have an appearance and character of stability, formerly not marked.

This line of thought occurred to us the other day in seeing that a $10,000 schoolhouse had been built at Redding, in Shasta county. This is not an isolated instance, of course, but it is a mark of progress of the interior of this State, which speaks volumes for the stability and prosperity of Northern California. The engraving on this page shows the appearance of the structure. The group for which it forms a background is a characteristic one. These youngsters are those to whom we must give way by-and-by, and who will conduct the affairs of the State in future years. The children thus brought up in the mining and farming regions furnish our sturdiest minded and bodied business and professional men. Pure air and habits of industry, the cultivation of simple tastes and recreations, and the freedom from the many evil surroundings of a city, give them a grand start to make good men and women.

The revived interest in the section of Northern California is only an earnest of what is going on all over the State. Southern California has been having a "boom" for some years, and has increased in richness, population and influence greatly. Northern California with its many advantages has been more or less neglected, but now attention is turned that way it is experiencing a revival which will soon put it on par with other sections of our favored State.

TIMBER DESTRUCTION.—Deputy U. S. Marshal Mellus a few days ago visited Placer county and served a complaint and summons on two mill owners, for cutting timber on Government land. The parties are charged with cutting 2,500,000 feet of pine timber, valued at $30,000. The case will be tried in the United States Circuit Court, and the defendants have 30 days in which to answer. The deputy marshal was informed while in Placer county that Chinamen near Indian Springs were cutting immense quantities of sugar pine on Government land. The trees are cut by them to be made into "shooks," and if their grain is not perfectly straight the trees are abandoned and other trees cut down. By this method great quantities of trees are felled and not used for any purpose.

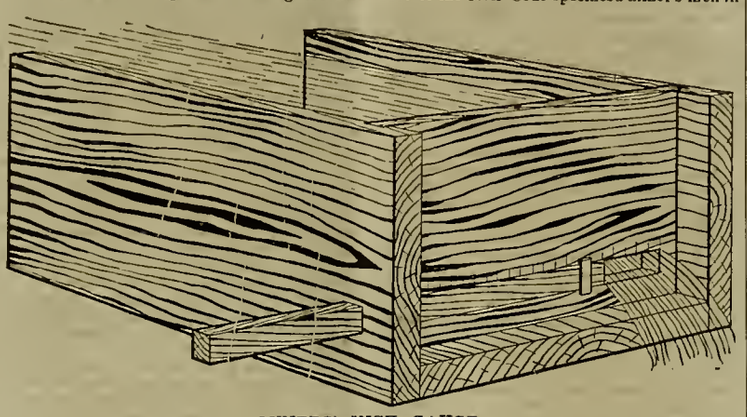
Surface and Underground Men.

In the working of mines the proportion of workers above and underground influences in a marked degree the cost of production. In many mines in this country we have far too many people connected with the mine on the surface—that is, they are disproportionate to the underground hands. The latter are the real developers, though those above, of course, assist the others in removing and handling material. A great deal depends on the way the works are laid out. If everything on the surface is properly arranged for handling ore and waste, fewer hands need be employed than when the work has to be done by "main strength and awkwardness." We have no statistics to tell the proportion of underground and surface labor in the precious metal mines of this country. Some interesting statistics recently published concerning the coal mines in France throw some light on the subject in connection with collieries.

The labor of the surface hands is in a sense non-productive. It deals only with the disposal of the produce of the underground labor. Like the relative efficiency of the miners of different localities—that is, the annual output per man employed underground—the relative proportion of the labor of a colliery performed at surface is indicative of the degree of economy attained, or at least of the relative cost of production in the different localities compared. From this point of view the following figures are instructive. They show the proportion of underground hands to surface hands in each of the departments mentioned: Pas-de-Calais, 1 to 0.27; Nord, 1 to 0.28; Puy-de-Dome, 1 to 0.31; Isere, 1 to 0.38; Bouches-du-Rhone, 1 to 0.44; Loire, 1 to 0.46; Saone-et-Loire, 1 to 0.47; Gard, 1 to 0.50; Haute-Saone, 1 to 0.51; Haute-Loire, 1 to 0.52; Allier, 1 to 0.52; Nievre, 1 to 0.54; Tarn, 1 to 0.55; Aveyron, 1 to 0.66; Herault, 1 to 0.70; Creuse, 1 to 0.83. The average is 1 to 0.40. Nearly one-half of the total number of colliery hands are to be found in the two first-named departments, where the proportion is lowest. Of the surface hands, the proportion of men to women, is 1 to 0.15; of men to children between the ages of 12 and 16, 1 to 0.10; and of men to women and children, 1 to 0.25. Underground the proportion of men to children is 1 to 0.071.

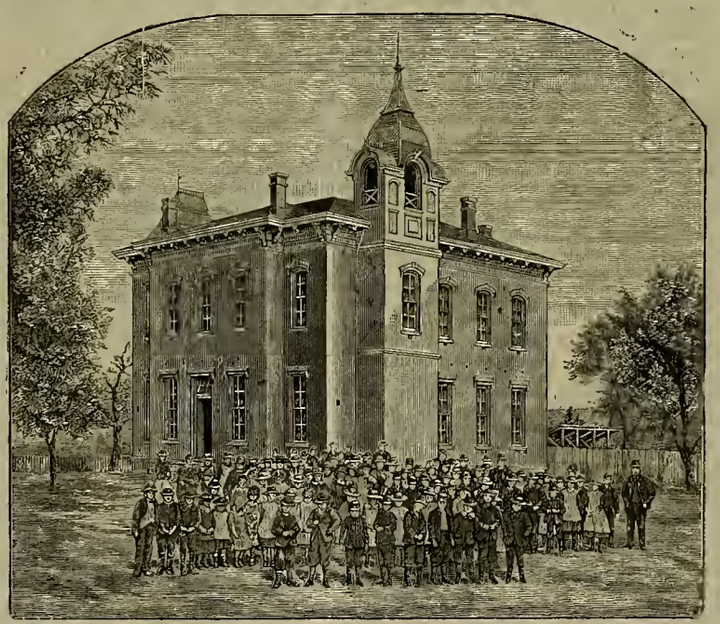
A Miner's Inch Gauge.

We give herewith a rough sketch of a miner's inch gauge, which any one can make for himself. The term miner's inch is more or less indefinite because California water companies do not all use the same kind of gauge. Section 1415 of the Civil Code specifies a miner's inch in this State as that quantity of water which will flow through an opening of one square inch in the bottom or side of a vessel, under a pressure of four inches above the opening. Fifty of these miner's inches are equal to a discharge of one cubic foot of water per second, and is less by .312 of a cubic foot than the Nevada county miner's inch.



MINERS' INCH GAUGE.

The generally accepted inch of water is that which is equal to 17,000 gallons of water every 24 hours, or about 100 pounds per minute; and this amount will flow through every square inch of opening in a gauge under a pressure of six inches above the center of the opening. With a gauge such as is shown in the cut, the 6-inch head can be obtained by opening or closing the slide, and the number of square inches remaining open indicates the amount of water passing through in miner's inches.



PUBLIC SCHOOLHOUSE AT REDDING, SHASTA COUNTY, CAL.

THE Alvarado Beet Sugar Factory of California, says an Eastern exchange, was kept in operation from August, 1884, to April, 1885—eight months. During that time it made 3,000,000 pounds of sugar. Sorghum factories in this country have not yet accomplished so much. There must be some virtues in the soil and climate of the Pacific Coast lands which we lack in the valley of the Mississippi or on the Atlantic slopes, for we cannot issue reports so hopeful.

THE public offices of London are guarded against dynamiters by 500 policemen in citizens' clothes.

Purifying the Water Supply of Cities.

One of the most important of subjects to the dweller in a large city is that of the purity of the water supply. While the water companies which furnish it are supposed to exercise great care in the matter of selling pure water, they are not always as careful as the consumers would desire. Even when free from animalcule or vegetable growth, there is often a flatness about the water which renders it unpalatable, more aeration seemingly being needed. In some places the water is aerated by fountains being formed in the reservoirs, but in most cases this aeration is entirely neglected. A new idea has lately been developed in Philadelphia, the water department of that city having, after considerable investigation, adopted a plan which has greatly improved the quality of the water, and put an end to the general complaint against its impurities. The problem has been solved by Prof. Albert R. Leeds, who after much careful study and persistent experimenting has hit upon a most ingenious, yet simply efficient and economical plan for purifying the water supply of cities, towns and villages, by the introduction of air under pressure into the water, likewise under pressure and motion.

The practicability of the system has been fully demonstrated at Hoboken, where the first experiments were made leading to its final adoption by the water works of that city, where it is now in successful operation. The system has also been thoroughly tested in Philadelphia, and the results have proved so satisfactory that the water department of that city has made arrangements for introducing the improvement on an extensive scale at its several pumping stations. The contract for building and furnishing the several air-compressing engines required for this purpose has been awarded to the Ingersoll Rock Drill Company of New York, their "straight line" single air-compressor having been selected by their engineers as the best suited for this kind of work. Three of these have already been delivered and the others will follow at an early date.

This system, which may be aptly called the "aerating process," is equally adapted for the purification of stagnant water in lakes, ponds, reservoirs, tanks, etc., so that its general adoption wherever foul and impure water exists, is much to be desired, and will be hailed as a blessing by all those communities who suffer from drinking impure or stale water, no less than from breathing the pestilential emanations of stagnant lakes and ponds.

In view of the vast importance of the subject and the daily growing necessity for such relief as this system offers, the parties owning and controlling the patents have organized into a permanent company, called the United States Pure Water Supply Company, for the purpose of properly introducing the system wherever it may be need. The company's headquarters for the present are at No. 10 Park place, New York.

THE ENGLISH COAL FIELDS.—The decadence of the English coal fields is often made a matter of discussion on both sides of the Atlantic. The latest instance is a pamphlet just issued in Liverpool entitled "Warning from the British Coal Fields," in which the author advocates the formation of a national association for the purpose of inquiring into probability of their early exhaustion. He is of the opinion that at the present rate of working, British coal will come to an end in 110 years.

An English journal, in reply, reminds the author that a royal commission of undoubted capability for the investigation, has looked into the whole matter and made a report in 1871, which gave nearly 450 years for the duration of the coal to the depth of 4,000 feet. In the zone exceeding that limit a quantity of coal which amounts to 48,465,000,000 tons is believed to exist. That report was based upon the most careful and trustworthy information obtainable.

REPEATING MATCHES.—The Russian Government has awarded a patent to the inventor of a means of so impregnating wood with a certain chemical that, when dried, the matches made from this prepared wood can be used several times over, thus effecting a saving of, it is claimed, at least 75 per cent.

A TAX of $5,000 a year has been placed by the Town Council of Wrightsville, Ga., on the sale of Jamaica ginger, the same that is laid on spirituous liquors.

Who Own the Vast Lumber Interests on Puget Sound.

In the western part of Washington Territory, says the Portland *Journal of Commerce*, and between the Cascade range on the east and Coast, or Olympic range, on the west, and between the 47th and 49th degrees of north latitude, is a thickly timbered belt of fir, cedar, alder, maple and other woods. Of these fir probably represents three-fourths. In the midst of this wealth of forest nature has placed a broad deep arm of the Pacific ocean—Puget sound—with which it is connected by the strait of Fuca. Thus not only has nature provided the timber, but the water-way also, by which it is possible for the merchant marine of the world to come and obtain their lumber supplies, much of which some time in the future must be furnished from these forests. Already the lumber trade with Australia, Central and South America, China and the islands of the Pacific amounts to fully 75,000,000 feet a year, and employs a fleet of about fifteen vessels every month.

Puget Sound is 200 miles long, and has a shore line of 1,800 miles. This irregular shore line forms innumerable harbors splendidly adapted for the erection of saw-mills and other wood-working factories, and also for the establishment of ship yards. Along this whole shore line, and from thence on both sides as far as the eye reaches, nothing can be seen but the vast and magnificent wealth of timber, save here and there where man has established a mill port, a town, or an occasional farm.

In the timber belt of western Washington there are 20,000,000 acres covered with timber, most of which is included within the limits named—an area nearly equal to the combined areas of the States of Connecticut, Massachusetts, Vermont, and New Hampshire. This timber belt will average 25,000 feet of lumber to the acre, or a total of 500,000,000,000 feet of lumber. Hence the saw-mills of Puget Sound, with their present capacity of 500,000,000 feet per year, would take 1,000 years to cut it down. The fir trees frequently attain the hight of 250 feet, and planks of lumber are sometimes turned out of these mills 100 feet in length.

Present Investments.

To show what has already been done by way of investment in saw-mills and timber lands, we give the following table:

Name and Location of Mill.	No. Mills.	Daily Cut.	Value Mill Property.
Puget Mill Co., Pt. Gamble, Pt. Ludlow and Utsalady	3	300,000	$3,000,000
Port Blakely Mill Co., Port Blakely	1	1,000,000	1,000,000
Washington Mill Co., Seabeck	1	125,000	500,000
Tacoma Mill Co., Tacoma	1	175,000	500,000
Port Madison Mill Co., Port Madison	1	80,000	300,000
Moore & Smith, Port Discovery	1	80,000	300,000
Stetson & Post, Seattle	2	50,000	200,000
Bellingham Mills, Bellingham	1	50,000	75,000
Milton Mill Co., Milton, opposite Seattle	1	40,000	70,000
Port Townsend Mill Co., Port Townsend	1	35,000	50,000
Washington Colony Mill, Whatcom	1	20,000	50,000
Seattle Lumber and Commercial Co., Seattle	1	20,000	50,000
Smith & Hatch, Tacoma	1	30,000	50,000
Seattle Mill Co., Seattle	1	15,000	40,000
Ostrander & Co., Seattle	1	30,000	40,000
Yesler Mill Co., Seattle	1	40,000	40,000
Michigan Mill Co., Seattle	1	25,000	40,000
Blackman Bros., Snohomish River	1	20,000	20,000
Lake Washington Mill Co., Seattle	1	10,000	10,000
Total	24	1,300,000	$5,330,000

It is possible, says the journal from which we quote, that a few mills may have been omitted.

The Lumber Fleet.

In addition to the foregoing statement of the wealth of the mill corporations, very many of them also own sailing vessels and steamers, which are engaged in carrying lumber from the various mill ports to San Francisco and foreign ports. Many of these corporations have agencies in San Francisco, where they own properties in the shape of lumber yards. The following list of sailing vessels and tugs owned by the mills is believed to be correct:

	Sailing vessels.	Tugs.
Puget Mill Co	10	4
Tacoma Mill Co	5	1
Port Blakely Mill Co	4	2
Washington Mill Co	2	2
Port Madison Mill Co	5	1
Stetson & Post	..	1
Moore & Smith	..	.
Total	26	11

The Stetson & Post Milling Co. is particularly spoken of by the *Journal* as being very strong, financially, and destined to become a very wealthy one, though not at present as large as many others. This company, located at Seattle, was organized about 1876, 10 years ago, by George W. Stetson and J. J. Post, who perhaps then had $1,000 between them. From this small beginning, they have grown until now, with the addition of L. W. and A. E. Stetson, they have recently incorporated under the name of "Stetson & Post Mill Company," having a paid-up capital of $200,000. This company owns two mills, located at Seattle—one a saw-mill and the other a sash and door factory. The land on which these mills are located is very valuable, as it consists of water front properties covering several acres.

The Detroit Copper Mines.

From an article in the *Deming Tribune* we take the following: The Detroit Copper Mining Co. was organized three years ago by E. B. Ward and others, of Detroit, and it gets its name from its originators. At present it belongs to Phelps, Dodge & Co., of New York, and Mr. Church, the latter gentleman being the manager of the property.

It is reached by the narrow gauge road which we have mentioned, via the incline of the Longfellow mine and then by a road owned jointly with the Arizona Copper Company, one and a half miles in length. This road gives direct rail communication from all its mines that are being worked with the smelters, so that the ores are handled very cheaply.

The furnace was at first located down at the river, the ore being hauled by wagons seven miles. Nine months since pumping works were put in at the river, consisting of two Worthington pumps having six-inch plungers and twelve inch stroke, utilizing the water power there to operate them. The water is forced six miles and is elevated 1,500 feet and 100,000 gallons per day can be delivered in the tanks at the mines. The two tanks have a capacity of 160,000 gallons. It is claimed there is no pumping plant in the country which equals it both as to distance and elevation.

The smelter is admirably located, easy of access from the mines, the cars being unloaded directly into the crushers, from which it goes to the bins below. Instead of weighing the charges individually, the ore is bedded in large bins opening on the charging floore so there is nothing for the wheelers to do but shovel it indiscriminately into the barrows. Mr. Church thinks it is the preferable method of preparing the charges and that it relieves the feeders from much responsibility. The coke bins are adjoining, so that neither ore nor fuel has to be moved more than 20 to 30 feet for delivery at the furnace doors. The dumping room for slag is equally close to the furnaces below, and there is unlimited room, as the mountain side slopes abruptly and to several hundred feet in depth. By the arrangements spoken of the labor required is reduced to the minimum.

A concentrator having a capacity of fifty tons per day is being erected with a view to utilizing the very large quantities of fine screenings, which are mixed with too much waste to allow smelting in their present form. Cullom jigs are to be used, and from experiments made it is believed there will be no doubt about the success of the undertaking.

The mines owned by the company are the Yankee, the Montezuma, Copper Mountain and Arizona Central.

Production.

Although much time has been lost since the mines were put in operation, owing to the time consumed in removal from the river, and more particularly by the loss of teams, etc., inflicted during the Indian raid two or three years ago, the mines had recorded a production up to May 1st of 8,500,000 pounds, and are now producing about 300,000 pounds per month. The capacity, if the two furnaces were in blast, would be about 150 tons daily, but at present only the smaller furnace is in operation.

The property is an exceedingly valuable one, and is evidently managed with excellent judgment and economically. There is no stock for sale, and there is not the slightest desire for notoriety.

BLUE RIVER MINES.—Last Thursday two wagon loads of Chinamen left Eugene for Blue river, a tributary of the McKenzie, to mine gold. Charles B. Cole took one load with Hickson's team, and a man residing on the McKenzie at the mouth of the Blue, whose name we did not learn, took the other lode. Twenty Chinamen went up in this gang, and it is reported that a few more will soon join them. Some mining was done on Blue river years ago, and gold exists along the stream in sufficient quantities to pay small wages. If the Chinamen will only turn their attention to mining, in such places as this, they will not interfere with our own people, and whatever they dig out of the ground and expend for provisions and supplies, will be just so much gained to the community. Friday morning Henry Hill started up for the Blue river mines with a wagon load of tools and provisions for the Chinamen.—*Oregon State Journal.*

THE Betty O'Neil mine at Lewis, Nev., has closed down indefinitely, owing to some trouble with the Miners' Union in regard to the wages paid the miners employed by its owner.

OWING to scarcity of water, the Klamath Quartz Mining Company's mill at Salmon river was shut down last week. The last clean-up realized something over running expenses.

Experts and Prospectors.

The *Miner* man happened to run across a would-be expert of a few months' experience in this country, the other day, who had collected together a few specimens of ore during his rambles, which he had been showing to different parties, asking them what it contained. Some told him that it carried a large per cent of silver, and was worth several hundred dollars to the ton. The self-styled expert, not feeling satisfied, asked his friends how long they had been in the country. Their reply was, something less than a year. Another party was asked as to what he thought of the ore. After turning the piece around, and examining it on all sides, he replied, "Well, I should say it was pretty good-looking ore, and will run awey up." How long have you been in the country?" asked the expert. The man replied, about one year. Finally, an old prospector was accosted as to his opinion. His reply was, "My friend, are you what is considered a mining expert?" He answered, "I am." "Well," says the prospector "have you ever had any practical experience in mining?" "No, sir." "Well, it seems you claim to know how to work a mine. Where did you get your experience?" "Why, sir," he said, "my knowledge was obtained from books." "Well, my friend," says the prospector, "a theoretical experience won't do without a practical knowledge. With a practical experience of some years, together with your theoretical knowledge, you may in time acquire sufficient knowledge how to systematically work a mine, and not till then." "How long have you been in the country?" asked the expert. The prospector's reply was, "about 20 years." "Well," says the expert, "you haven't given me your opinion of this piece of ore." "Well, sir, take it to an assayer, have him assay it and he will tell you more about it than any other man you will meet. While some may think they know all about it, yet you will find that the most reliable man is the assayer." Mr. Expert left the next day for the East, a wiser man. This incident illustrates thoroughly the different stages through which a person has to pass before he has the conceit taken out of him. We find in most all our mining camps, men who know more, in their own estimation, with a few months' experience, than men who have made mining a study for years. How many so-called experts are sent to this country from the East every year? A practical miner's advice on a mine is far preferable. When Eastern capitalists are made to see this matter in its proper light, there will be fewer failures in mining.—*Colorado Miner.*

PURCHASING UTAH ORES.—There exists a slight breeze of competition between the ore buyers of Salt Lake. Up to within the past few months this market was pretty much controlled by inside buyers, but since that time Mr. F. H. Shepherd, with the Pueblo Smelting and Refining Company, and Mr. McKinney, representing the Kansas City Smelting and Refining Company, have been working on the outside, purchasing nearly all the odd lots of ore not contracted for by the year. A gentleman who has sold some ore, in speaking to a reporter, said that Mr. Shepherd was for some time in this city before any one learned his purpose. He was known, from his reticent, quiet manner, as the "Unknown," but a few weeks ago he made some heavy purchases of ore, paying on the outside a trifle better figure than had been offered by other buyers. This has led to a bit of rivalship whereby the man giving the highest bid gets the purchase. Mr. Hanauer handles Ontario and several ores for his own use and shipment to Omaha and Denver. T. R. Jones purchases entirely for the Germania smelters, seven miles south. Scott & Anderson supply the Mingo at Sandy, which, with Shepherd and McKinney, constitute the regular buyers of Utah, Wood River, and Nevada ores. The Brooklyn and Yosemite ores, from Bingham, are not under contract, and are bought in odd lots. Most of the best mines, including the Crescent, Ontario and Daly, of Park City, the Bullion and Eureka, of Tintic, and several others, are under contract up to July 1st, and some to October of this year, but after these dates some rivalry may be expected in the purchase of their ores.—*Salt Lake Democrat.*

MINT STATISTICS.—Among the tables in the special report of the Director of the Mint on the production of gold and silver, soon to be published in a statement by years, showing the deposits of domestic gold bullion at the Mint and Assay Offices from July 1, 1873 to January 1, 1885, which amounted to $415,000,000, and also the production as estimated by the Director during the same period, amounting to $428,000,000; total estimation for 11½ years being only $13,000,000 in excess of the deposits of domestic gold during the last fiscal years. The deposits of foreign coin and bullion have exceeded the net imports by over $13,000,000, showing that considerable foreign coin is brought by immigrants upon their persons, and some foreign gold bullion, probably brought by rail, is not reported at the custom houses. Another table shows the gold coinage at United States mints for the last 12 fiscal years, which amounts, after deducting United States gold coins remelted, to $545,106,114.

The Mining Outlook in Oregon.

Many circumstances point to an important extension of mining enterprise in Oregon and Washington in the near future. All the old and paying mines are being worked diligently, and hardly a week passes without a mineral discovery in some part of the country. From western, southern and eastern Oregon, and from several points in eastern Washington, reports of rich discoveries have come within the past month. The country, it seems, is being more thoroughly prospected than ever before. The dullness in general business has turned the attention of many men to mining, and in all directions the mountains are being searched for the precious deposits which it is certain lie hidden in their depths.

In the hopeful estimate of the business prospect recently put forth by the *Oregonian*, no account was made in the benefits likely to come to the country from this branch of industry (for simply as an industry mining must hereafter be followed), but it, too, might have been added as an important item. The output of our mines now operated will largely exceed that of any recent year, and there is reason to hope for a further large increase through the opening of entirely new fields.

It is by no means certain that the reduction works, so much talked about, will be established. Enough money to build and fully equip such works has been pledged, but the railroad companies have withdrawn the rates for bullion which they offered when the scheme was proposed, and under the rates now given there is no assurance of profit. The whole matter rests with the railroad companies, and it is certainly to be hoped that they will find a way to make sufficient low rates. The existence of works here would make Portland a mining center and stimulate the increase of mining enterprise throughout the country.—*Oregonian.*

THE GOLD MILL.—The Camae No. 2 mill is being visited daily by mining and mill men, all of whom agree that it is working smoothly and seems to be doing good work. Yesterday afternoon the amalgam on the silvered plates was scraped off, and between four and five pounds taken up; but it is, of course, impossible to estimate its value, as it has not been tested. The ore carries from four to six ounces of silver and one to two ounces of gold per ton, but the proportion of each metal saved is not known. The assay furnace was to be completed to-day, and to-morrow assays will doubtless be made of the amalgam, tailings and battery run. Then a "guess" can be made of the yield per ton. But no until a couple of weekly clean-ups shall have been made can anything like average results be definitely known. The first clean-up will be made next Sunday night or Monday morning, when the first week's run shall be completed.—*Wood River Times.*

GOLD AND SILVER.—Messrs. W. C. Dawes and W. H. Robbins came in from the mines Sunday night last, the former with 1,700 ounces of silver, the latter with 132 ounces of gold. Mr. Dawes took the silver out of Peck mine tailings. Mr. Robbins got his gold out of rock from the Del Pasco and another mine. The gold, which is worth in the neighborhood of $1,848, is the result of seven days' run of the Del Pasco 4-stamp mill. As there is plenty more rock as was crushed, in the mine, Mr. Robbins and his partner, Mr. Gobin, have "a good thing." They may, ere long, add more stamps and put in a concentrator or two.—*Prescott Courier.*

CEMENT MINING.—It has been well known for 30 years to the residents of the East Branch of Feather river, that there was an immense body of gold-bearing cement between Twelve-mile Bar and Rich Bar, some of it paying as much as $3 to the pan. A company has been lately organized in San Francisco to work this cement. The parties claim that they have a process by which they can dissolve it at a cost of 75 cents per ton. If their process is what they claim for it, "there is millions in it," for the cement is rich beyond a doubt. The parties went down from Meadow Valley last Tuesday to commence operations. We wish them success in the undertaking.—*Plumas National.*

RICH ORES.—William Merrill, who has been prospecting about 35 miles due west from Winnemucca, brought in a sack of various kinds of ores yesterday. He has rich chloride and sulphuret silver ores, specimens of almost pure galena, and samples of nickel and cobalt ores. He says there are nine veins carrying galena, three nickel leads, and 14 carrying silver, which crop out in the district, with doubtless many more that do not show themselves on the surface. It is a good place for prospectors, and an inviting field for anybody who desires to build reduction works.—*Silver State.*

THOMAS WILLIAMS took out of his placer mine in Gordon Gulch, White Pine mining district, Kern county, during last winter, 50,000 buckets of gravel, yielding $800 or $1,000. The buckets were hoisted with a windlass at very little expense.

ORO district, 25 miles south of Cherry Creek (gold bearing), White Pine county, Nev., where several parties are now at work, promises in the near future to make such a showing as will attract considerable attention.

Sending Logs Down Nevada Mountains.

One nf the most interesting sights to bo seen in the Sierras is the manuer in which logs aro sent dowu to the valleys or river canyons from the timber hights above. A contemporary gives the following graphic description of one of these scenes as follows:

A cbute is laid from ths river's brink up the steep mountain to tho railroad, and while we are telling it, the monster logs aro rushing, thundering, flying, leaping down tho declivity. They come with the speed of a thunderbolt, and somewhat of its roar. A track of fire and smoke follow them—fire struck by their friction witb the chute logs. They descend the seventeen hundred feet of tho chute in fourteen seconds. Iu doing so, they drop seven hundred feet perpendicularly. They strike the deep water with a report that can be heard a mile distant. Logs fired from a cannon could scarcely havo a greator velocity than they havo at the foot nf the chute. The average velocity is over one hundred feet a second throughout the entire distance, and at the instant they leap from the mouth their speed must be fully two hundred feet per second. A sugar-pine log sometimes weighs ton tons.

What a missile! How the water is dashed into the air! Like a grand plume of diamonds and rainbows, the feathery spray is hurled to tho hight of a hundred feet. It forms tbe grandest fountain ever bebeld. How the waters foam aud seetbe, and lash against the shore! One log having spent its force by its mad plunge into the deep waters, has floated so as to be at right angles with the path of the descending monsters. The mouth of tho chute is, perhaps, 14 feet above the surface of the water. A huge log, hurled from the cbute, cleaves the air and alights on tho floating log. You know how a bullet glauces, but can you imagine a saw-log glancing? The end strikes with a heavy shock, but glides quickly past for a short distance; then a clash like the reverberation of artillery, the falling log springs vertically into the air, and with a curve like a rocket falls into tbe water, a long distance from tbe log it struck.

BOYS AND TRADES.—An exchange believes that the old apprenticeship system is in the main responsible for the aversion that such a large number of boys manifest for learning trades. For the first year under that system a boy in a blacksmith shop, for instance, is put to the roughest and most disagreeable work. He is made to do a thousand-and-one things that will be no use to him when he grows up, and bave nothing to do with making him a skillful mechanic. He knows tbis and naturally rebels and wants to do something that will be of benefit to him. He is brought up to feel that to be a good blacksmith a man requires much brawn and little brains. That he obtains an erroneous idea of the trade he is trying to learn we all know, but nevertheless this impression is apt to become fixed in his mind from tbe character of tbe work he is put to do. Is it any wonder that be looks with envy on the boy behind a counter or in a lawyer's office, and longs to get away from an employment which has become irksome?

THE COOPER UNION, NEW YORK.—This free institution is doing a good work in educating and improving the young people of that city. An abstract of the last annual report shows that during the year thsre were 4,208 pupils in its schools. Of this number 531 attended the Industrial Art Classes for Young Women in the day time. More than 650,000 persons bave used tho reading room during the year, and nearly 200,000 books have been lent to readers to take to their homes. Tbe evening art schools are largely attented, and there are aleo scientific classes wbich pursue a regular course of study extending over a period of five years Thanks to tbe benefaction of its founder, the Cooper Union appears to be doing a larger share of this kind of educational work than any other institution in the country. Such an institution is needed in every large city in the Union.

THE NEW LABOR BUREAU.—Secretary Lamar has appointed seventeen gentlemen in as many different States as special agents for the new Bureau of Labor. All the appointments thus far are in States east of ths Mississippi State, except one for Missouri. It is to he presumed that an agent will be eventually appointed for each State. It is said that in the appointments thus far made the Secretary has acted without regard to political affiliation of the persons appointed, and moreover that they have been selected without regard to any known theories as to labor and industry wbich they may heretofore have entertained. Each man is expected to give his best tbought and judgment to the matter. The appointees thus far represent all the various shades of political opinion, and also etand upon all sides of the tariff question.

LOW RATES OF INTEREST.—The State of Connecticut has recently issued almost $2,000,000 in bonde, which were sold at nearly one-quarter of one per cent *above* par. They are not redeemable until 1910, and hear but three per cent intereet. This transaction shows at what a low price money can be borrowed when the eecurity ie undoubted.

USEFUL INFORMATION.

A New and Useful Paint.

"Ulscote" is tho name of a new and what ie claimed to be a very useful paint. Tbe word, at least, has a powerful signification for good, as it signifies a "preserver of matter." It is said that this new pigment possesses wonderful preservative qualities, and gives to any surface of wood or metal to which it is applied a metallic coating, which most effectually resists the action of the elements, as well as the salt air, so destructive to paints along the sea coast. Its density is so great tbat it possesses covering powers in excess of any other pigments. They say 38½ lbs. will cover ae much surface as 100 lbs. of lead witb the same amount of oil. Tho natural color is a grayish blue, and from this as a base can be made all the popular dark colors and shades for house, iron, bridge or other painting.

From this pigment is also made a marine paint, which not only protects iron or wood from barnacles or fouling, but effectively resists the action of tbe "teredo," so destructive to wooden vessels, piers, etc. As an illustration of this, a piece of wood is shown which was coated with "Ulesote," and attached to a piece of unprepared timber, both of which were submerged in water for a period of about three and a half months, during May, June, July and August. The two pieces attached were sawed in the center, when it was found that the paint had resisted the attack of the formidable pest completely, while the piece of timber to which it was attached was completely honey-combed.

There is also shown a piece of sheet-iron, which, after being painted on one side with "Ulesote," was submerged for a period of about six months in salt water. The painted side shows the iron to be perfectly protected both from rust and fouling, whereas the unpainted side is thickly coated with rust and scale. The great density and covering properties of this paint are such that one pound of the "Ulesote" paste and one pound of linseed oil will give a priming coat to over 100 square feet of dry-planed boards.

Baseballs and Their Manufacture.

Very few persons are aware either of the extent of the business of baseball manufacture or of the processes involved in that industry. It is estimated that fully ten millions of baseballs are manufactured and sold in this country every year. The most expert workmen are employed, and the process, as described by a cotemporary, is as follows:

First, there is a little hard rubber ball, and around that tbe wrapper winds a strong, blue, coarse yarn. When this reaches a prescribed size it is firmly wrapped with ths white Venetian yarn.

The balls are then placed in an oven and baked until all the moisture is taken out of them and they are reduced in size. This makes them solid. After this they are coated with cement. This causes the balls to retain their shape and they cannot be knocked crooked. Then comes some fine blue yarn, and around the whole is placed fine white gilling twine. The balls are weigbed, for each must be of certain weight, and are now ready for the covers. These latter are made of tbe best quality of horse hide. The cover consists of two pieces, each cut in the shape of the figure "8." By bending one section one way and tbe other in an opposite direction a complete cover is obtained.

For years balls were covered with four pieces of leather, and at one time two covers were placed upon a ball; that is, the ball was half made when it was covered, and then another ball constructed over it. But even that did not prevent its being knocked out of shape. They cannot disturb tbe ball as now made because tbe cement holds it.

A little machine owned by a Philadelphia firm is used for winding the balls. It wraps two and a half ounces of the American Association balls in a minute, and the rest is finished by hand. That apparatus is a little wonder. It does its work as neatly as if it had brains, but is capable, say its owners, of a good deal of improvement.

SECOND-HAND BARRELS.—The second-hand barrel business has become quite an extensive industry in New England. Boston is the center of the business. Flour barrels take the lead. Tbey are collected of grocers and consumers of flour all over New England, and are put to a great variety of uses. A small proportion are used again hy millers; the sugar houses use quite a large number; also fertilizer manufacturers, and the miscellaneous demands are legion. A largs number are ordinarily shipped to Norfolk, Va., each year and used for packing the vast quantity of "garden truck," whicb is sent to Northern markets. Flour barrels as they are "picked up," from the etores and bakeries, within "carting distance" of Boston are worth to-day 12 to 14 cents; when "trimmed," 17 to 22 cents. Nsw flour barrels cost to make from 32 to 35 cents each, and in most cases would be no better for ths uses to which tbe great bulk of second hand flour barrels are put.

The businese in oil barrels in Boston is one which has grown from comparatively nothing a few years ago, to quite a sizable business today, ths petroleum industry being the largest "consumer." Oil barrels are made of well-seasoned white oak staves and heads, with iron hoops and the first use, to which the greater number of new oil barrels made are put, is to hold petroleum. New oil barrels cost from $1.15 to $1.20 in Titusville, Pa., and about $1.30 in New York, while in Boston very few new oil barrels are used. Second-hand kerosene barrels are worth $1 to $1.12, lubricating oil barrels, 65 to 75 cents, tanners and curriers fish oil barrels 60 to 70 cents; these prices for large second-hand barrels in good order, delivered in Boston.

Second-hand whisky barrels are quotable at 65 and 70 cents.

EMBOSSED LEATHER.—Hundrede of men, women, and even boys, in New York, says ths Brooklyn *Eagle*, are engaged in the "business" of collecting old boots and shoes, which they take to the wall-paper factories, where they receive from 5 to 15 cents per pair. Calfskin boots bring the best price, while cowhide ones are not taken at auy figure. These boots and shoes are first soaked in several waters to get the dirt off, and then the nails and threads are removed and the leather is ground up into a fine pulp. Then it is pressed upon a ground of heavy paper, which is to be used in the manufacture of "embossed leather." Fashiouable people think they are going away back to mediæval times when they have the walls of their libraries and dining-rooms covered with this, and remain in blissful ignorance that the shoes and boots which their neighbors tbrew in the ash-barrel a month before now adorn their walls and hang on the screens which protect their eyes from the fire. Carriage-top makers and bookbinders also buy old boots and shoes, the former to make leather tops for carriages and the latter leather bindings for the cheaper grade of books. The new styles of leather frames with leather mats in them are entirely made of the cast-off covering of our feet.

PECULIARITIES OF ANIMALS.—All ruminating hoofed beasts have horns and cloven feet. If the hoofs are even tbe horns are even; if odd, as in the rhinoceros, the horns are odd, that is single or two placed one behind the other. Creatures with feathers always have beake. Pigeons with short beaks have small feet. Tbe long limbs of the houud are associated with a long bead.

GOOD HEALTH.

When Your Girth Increases.

There is that occasional visit to tbe tailor, who, tape in band, announces in commercial monotone to the listening clerk the various measuremeuts of our girth, and congratulates us on the gradual increase thereof. He never in his life saw you looking so well, and "fancy, sir, you are another inch below your armpits," —a good deal below—"since last year!" insiduously ineinuating that in another year or so you will have nearly as fine a chest as Heenan! And you, poor, deluded victim, are more than half willing to believe that your increasing size is an equivalent to increasing health and strengtb, especially as your wife emphatically takes that view, and regards your augmenting portliness with approval. Ten years have now passed away since you were 40, and by weight 12½ etone—a fair proportion for your height and build. Now you turn the scale to 1 stone more, every ounce of which is fat—extra weight to be carried through all the labors of life. If you coutinue your present dietary and habite and live five or seven years more the burden of fat will be doubled, and that insinuating tailor will be still congratulating you. Meantime you are "running the race of life"—a figure of speech less appropriate to you at the present moment than it formerly was—handicapped by weight which makes active movement difficult, upstair ascents troublesome, respiration thick and panting. Not one man in 50 lives to a good old age in this condition. Ths typical man of 80 or 90 years, still retaining a respectable amount of energy of body and mind, is lean and spare and lives on slender rations. Neither your heart nor your lunge can act easily or healthily, being oppressed by the gradually gathering fat around. And this because you continue to eat and drink as you did, when youth and activity disposed of that moiety of food which was consumed over and above what the body required for sustenance. Such is the import of that balance of unexpended ailment which your tailor and your foolish friends admire, and the gradual disappearance of which, should you recover your senses and diminish it, they will still deplore, balf frightening you back to your old habits again by saying: "You are growing thin; what can be the matter with you?" Insane and mischievous delusiou.—*Nineteenth Century*.

AMOUNT OF EXERCISE REQUIRED.—Dr. Parkes has calculated that the amount of exercise a man in health sbould take regularly is equal to walking nine miles a day upon level ground. The amount of walking done in walking about the house and other domestic duties may probably be put down as three miles, which will leave only a walk of six miles per diem on level ground. If the ground ie hilly, this will be still more reduced, eo that it certainly doee not seem an excessive amount to advise. The proper quantity muet, however, vary greatly with circumstauces. Females, for exampls, will not take as much ae men. In winter more may be tsken than in summer. In youth, when the body is undergoing its most active development, care must be taken that every muscle is exercised in turn. Hence, the free use of gymnastics, games aud sports at this ags is most beneficial. In advanced life ths power aud inclination fur exercise both fail, but sven then every effort should be made to prevail upon the individual to take some amount of exercise, and to postpone the evil day when he will become completely bed-ridden. Such an amount of exercise is in all cases necessary as will keep the muscles in good health, and enable them to meet the physical requirements of the rest of ths body.

Helenina—A New Antiseptic.

Ths London *Lancet* states that some articles have appeared in recent numbers of the *Boletin Farmaceutico*, of Barcelona, calling attention to a drug which seems to be well known in Spain, but which, not having been prescribed witb due regard to its physiological properties, has disappointed many, and so has fallen into undeserved disrepute. The drug referred to is helenina, the active principle of Inula helenium (elecampane). It was formerly used for itch and herpes. It has now been found to have powerful antiseptic properties. Dr. Korah found that 50 centigrammee were sufficient to entirely arrest putrefaction in fivs liters of urine —*i. e.*, one in 10,000 parts. A slice of veal sprinkled with a solution of 25 centigrammes of helenina in two grammee of alcobol, and kept at a temperature of 28° C., remained perfectly sweet for ten days, by which time it was completely dried up.

Au egg beaten up with 300 grammes of water, to which was added 30 centigrammes (about five grains) of helenina dissolved in two grammes of alcohol, remained unchanged at the temperature of 28° C. for six days. Another egg similarly beaten up without the drug, and kept at the temperature mentioned, rapidly decomposed, and in 20 hours emitted a strong odor of sulphide of hydrogen; to this a solution of 50 centigrammes of helenina was added, and in a few minutes the offensive odor had disappeared, and the mixture underwent no further change. Similar experiments with urine, meat and beaten up eggs were made with carbolic acid, boracic acid, and salicylic acid, instead of of helenina; but much larger proportions of these substances were required to prevent putrefaction, and none of them were capable of arresting commencing putrefaction of the egg, as helenina had done.

Korab found that a few drops of a solution of helenina immediately killed the organisms in ordinary infusions, and also in cultivations of the tubercle bacillus. While the writer was working with helenina in his laboratory, he noticed that the bad odors usually present in the vicinity were replaced by the aromatic smell of the drug, due to the washings thrown away. He also noticed that insects, which were commonly very numerous, were at that time absent; even tbe mosquitoes were kept from the whole house during the months in which they specially abouud. Ths drug has proved most valuable in surgery as an antiseptic when carbolic acid and other agents had failed. It has been successfully given internally iu malarial fevers, tubercular, infantile, and catarrhal diarrhœa; and it is expected to prove an excellent substitute for carbolic acid in the Listerian system of aseptic surgery. The dose is about a third of a grain in pill or mucilage, and the price about a penny a grain.

Some New Corn Cures.

The London *Chemist and Druggist* notices some new corn cures substantially as follows:

Salicylic plaster has recently been put on the market as a cure for corns, bunions and thickened skins generally, which some may prefer to make for themselves. This any chemist can easily do. Dissolve two drachms each of salicylic and common yellow resin in six drachms of sulphuric ether, and paint the solution over heliadonna or opium plaster spread on swans'-down. The pigment dries almost instantaneously, and the plaster is then ready for cutting up into suitable sizes for corns. The whole does not cost more than three or four shillings per yard, and several thousand plasters may be made out of that quantity.

Some corns are so painful that neither paint nor plaster can be endured, something of the nature of a shield alone giving relief. For such cases the following wrinkle may be appreciated: Take a corn shield, enlarge the diameter of the hole to a small extent by means of a knife or scissors, and apply in the usual way. Then place in tbe hollow thus formed over the corn a small quantity of any of the following solutions: Salicylic acid and ext. Cannabis ind. dissolved in ether, or ext. Cannabis indica one-half drachm, dissolved in two drachms of liquor potassæ, or a saturated solution of iodine or iodide of potash in strong alcohol. Tbe shield does the double service of taking the pressure of the boot off the corn, and at the same time preventing the liquid being rubbed off by the sock, while all of these solutions penetrate the skin much more rapidly than the ueual collodion prepsration, and are consequently much more effective in their operation. The eaturated solution of iodine often succeeds in removing corns and indurated epidermis when other remedies have failed, and the well known eolvent acton of liquor potassæ is a sufficient credential to induce for it at least a trial.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

PACIFIC.—*Ledger*, June 20: Reports reach us to the effect that last Friday the richest rock yet encountered in this famous mine was struck in the 1,500-foot level. It is the intention to run the works to their utmost capacity for several weeks to come, so as to get a supply of about 600 tons of ore on the dump—and then shut down active mining for a month, so as to enable a thorough repair of the works to be made. It is expected to get sufficient ore ahead to run the mill steadily during the period of suspension.

MOORE.—Amador *Sentinel*, June 17: The hoisting works at the Moore mine are now in running order, and the lowering of the water commenced to-day. Messrs. Thomas and Varnum, mining men of San Francisco, have been looking at the Kennedy mine during the week, and we understand that there is some prospect that the mine will be again started. We understand that Warren Rose will shortly assume the superintendency of the Mammoth and Moore mines. Mr. Rose is a mining superintendent of extensive experience and energy, and his selection will no doubt prove a profitable one. The Green Aden mine of Plymouth is exciting considerable interest just now. Hayward is said to be desirous of purchasing it, and an English company is reported to have offered $20,000 for the property. Should the latter get it we understand that active operations will be at once commenced. Of course the owners desire to sell to the highest bidder.

MISCELLANEOUS.—The El Dorado mine of Amador City, owned by Dr. T. H. Mayon, has been started up again. The shaft is sunk on the ledge, and was between 200 and 300 feet deep when work was suspended, the ore body showed of fair width and quality, with every prospect of developing into a good mine. It is now intended to sink the shaft deeper, and otherwise open out the property. A. Hayward has purchased the Dead Horse mine near Sonora, Tuolumne county, and is having the machinery of the Seaton mine, near Drytown, removed there, for the purpose of at once proceeding with its development. W. A. Nevills has purchased the Roseberry mine at Angels, Calaveras county. He has also secured a one-third interest in the adjoining claim, which has been worked with success for some time past, keeping a 10-stamp mill going. There is a large body of ore, said to yield $10 per ton, the ledge extending to the Roseberry boundary, and evidently running beyond it. Mr. Nevills has secured the services of W. Rose, formerly superintendent of the Zeile, to take charge of the works. Mr. Randall, who has been operating a gravel claim on the land of A. P. Clough near Volcano the past season, is engaged in cleaning up. He has taken out over 90 ounces, and with what still remains to be cleaned up, he expects to realize at least $2,000 as the gross result of the run. The Grass Valley gravel claim near Volcano is said to have taken out $25,000 last year. The general opinion is that the present clean-up will turn out equally well. The balance of the Duncan concentrators for the Amador Queen mill in Hunt's gulch are on the ground. It is expected to have the mill ready to commence crushing some time next week. The St. Julian made a clean-up a few days ago. The yield averaged about $12 per ton. The crushing consisted of average ledge matter, and included none of the rich pockety ore. The mine is now being worked by the stockholder's, the contractors having surrendered it on account of difficulty in controlling the water, and other obstacles. The owners now propose to commence a new tunnel, to tap the rich deposit at a point considerably below the winze which has been sunk in the present tunnel. There are four men employed by the company. Several persons interested in the St. Louis mine, near Pine Grove, came up from San Francisco this week to inspect the property and look into the title. O. C. Hewitt, superintendent of the Keystone, visited the mine with them.

ACTIVITY.—Amador *Dispatch*, June 20: We took a short drive down as far as Middle Bar, on the Mokelumne river, last Sunday, and were much pleased to notice the healthy activity that prevails in mining matters in that vicinity, and the bright prospects that seem to be in store for many of the mine owners. We saw enough to convince us that the future outlook of the mining interests between Jackson and the Bar are very encouraging. We were shown some very rich rock which had just been taken out of the Abe McKinney's mine, and also a number of very rich specimens that had been taken out of the Marlette mine, showing free gold in very large quantities. We found the little 1-stamp mill at the St. Julian industriously pounding away on some very good looking ore, from which the owners expect a liberal yield of the precious metal. We also learn that another very rich strike was made in this mine last Tuesday, and that the ore is of a somewhat different quality from that heretofore taken out, being of an iron base and quite red. This new ore is said to be fully as rich, if not richer, than any that has ever been found in this mine, with the probable exception of a few of the richest specimens. We next visited the Quinn mine, where we found quite a lot of good looking rock on the dump pile, but as the workmen were taking their usual Sabbath rest, and were not at the mine, we were unable to ask any questions as to the supposed richness of the ore. Shortly after leaving this place we came to the mouth of the Mammoth tunnel, where we found everything quiet except the air compressor, which did not seem to have any conscientious scruples about breaking the holy Sabbath, The compressor is run by water-power, and forces air into the great tunnel, which penetrates the hill to the distance of 2,200 feet, and furnishes the motive power for running the famous Burleigh drills which are used in the tunnel. The company are erecting a new assay office at the mouth of the tunnel, and making other improvements of a substantial nature, which indicate that they have abounded confidence in the richness and permanency of the mine. The Casco and Kelly mines are lying idle at present, but it is expected that work will be resumed on them before a great while. The Amador Queen mill is completed and will be started up as soon as the rock breaker and concentrators can be got ready, which will be in a very few days. It is a good substantial looking structure, and if the mine turns out as rich as anticipated it will be one of the best paying mines in the county. There are also a number of other mines being prospected along the route on a limited scale, which give promise of being very valuable when they are fully developed; but the work of development is necessarily proceeding very slowly on account of the owners being men of limited means. We hope, however, to be able to give a good account of them in due time.

Calaveras.

IMPORTANT DISCOVERY.—Cor. Calaveras *Chronicle*, June 20: The recent discovery made near Rich gulch, known as the Black Mammoth, and owned by Severns & Ochoa, of this place, promises to be one of importance, the rock being rich in quality. The many tons of "float" prospect well in the Hornspoon. Samples from the outcropping assay from $20 to $40 per ton. The ledge is 20 feet wide. A lot of the ore is being worked at the Simpson furnace. The ore is heavily charged with iron. The Russell reduction works is running in full blast. The Tustin pulverizer works magically and the work of roasting ore goes on unceasingly.

MORE GOOD ROCK.—The Tiger mine at Rich gulch owned by Mr. C. Schlund of this place, continues to yield number one rock. The shaft is now down 100 feet—some 30 feet below the rich find mentioned a short time since—and a level is now being run. Good milling rock was found all the way down, and some exceedingly rich specimens coming from the depth reached were shown us. From the indications, when the rock from the Tiger is milled, the yield will be astonishing, we predict.

ANGELS CAMP.—Henry B. Potter & Co. have consummated a sale of their mining property in this place formerly known as the Big mine and the Hill mine for the sum of $40,000, as is stated by San Francisco capitalists who intend erecting a 40-stamp mill on the mine. The Bachtele Mining Company, which is composed of Bachtele, W. A. Nevilles and Senator Jones, are going to enlarge their mill in order to place more machinery upon it, the mine giving satisfaction to the owners. The Lane mine is looking well, and the 20-stamp mill is running steady day and night with satisfactory results. It is also stated in Sutter creek that Senator Fair will soon start operations on his mine which has formerly been known as the Crystal mine. Capitalists seem to have their attention drawn this way in order to invest.

Inyo.

LEE DISTRICT REVIVING.—*Reporter*, June 20: We learn that our old friend Jack Wilson, of Darwin, who has interests, with others in the old Lee district, is making some fine developments of rich silver milling ore. He is fully encouraged to believe from the several tons of high grade ore already put out under his supervision, and the fine showing in sight, that old Lee will soon make itself known here and hereabouts; and perhaps convince capital what Inyo county is—that is, a good reliable mining region for practical mining capital to look into; and nobody's say should be taken till it has been investigated. Ore from the new developments is said to run from $200 to $500 per ton in value.

RUSS AND BEVERIDGE.—Bell and Thomas have just received their returns for ore shipped from the Brown Monster mine, which is reported to have been the best ore shipped from that district—Jos. McDermitt and his partners have just received their returns. The result of their last few months' work was about 65 ounces of fine gold. Chas. Hagan, of the same party, also crushed some ore which he took out by himself last winter, and is some $500 or $600 better off by his perseverance where others said they could not succeed.

Mariposa.

MINES AND MILLS.—Mariposa *Gazette*, June 20: Notwithstanding the quartz mining interest of the county, for the past year or two, has been comparatively dead, we are pleased to say that there are at present as many mines and mills in operation as at any time for many years. In the places of several old mines that have suspended or petered out, other new mines and mills have sprung up, and if the truth could be ascertained, nearly as much gold is being taken out and shipped as at any time since the Hite mine suspended. The two companies on Sweetwater, Adams & Carter and Jimmy Ferguson, are new, having sprung into existence within the past year or two. Adams & Carter, who are successors to the Groves Bros., have a ten-stamp mill, and since their purchase have added considerable other machinery to the works, which, altogether, makes a complete outfit for a mine. They own and work the two mines known as the "Harbert" and "Rollins Mines," the latter is said to be producing some excellent ore. This company gives employment to some thirty persons, which includes miners, millhands and for sundry other purposes. Jimmy Ferguson has three separate mines from which he extracts ore, and quite recently a rich bunch of ore was struck which elevated its owner to a high estimate of his worldly wealth. Mr. Ferguson works some eight or ten hands and his eight-stamp mill is said to be very perfect. Its enterprising owner is deserving of success.

HITE'S COVE.—A rich strike is reported from Hite's Cove by Mr. Barley, a miner, who has been residing there for a long time, His latest discovery is from a small vein which he traced to where it crossed the river and entered the mountain on the south side. It is undoubtedly a very rich strike. Mr. John Groves has moved into the Cove with his family, and from other indications, the Hite Cove mine and mills are going to start up again soon under the management of Mr. Hite, himself, who is now the owner of the whole property. This will be the greatest blessing that could happen to that whole section of country and one that will be permanent. The Vanderbilt mine, on Mount Buckingham, owned by Hall & Starr, is, we believe, in readiness to crush rock and turn out the gold. They have been engaged for sometime running a 400 foot tunnel, which is nearly completed. The mill, concentrators and every other requirement necessary to work a mine, is very complete and ready to move when the supply of quartz is to be had. In the same region of country, J. H. Green and H. F. Marsh are opening a new mine which is said to be a rich find. They are sinking on a vein and piling up the ore. At present they are rich in imagination, which we hope will prove all they claim for it. Assays have, we understand, been made, which yielded largely. We shall probably know more about this mine after awhile, for Green & Marsh are practical miners and hard workers, and they can't get rich without somebody knowing of it. In the Hornitos district, the London and Quartz mountain mines are all in motion and are creating a new prosperity in that section. These mines are being worked by some new fangled machinery known as Wiswell's invention and lightning concentrators, saving gold by electricity. What next? The new process has been on trial for some time, but we have not heard any opinion whether the machinery and electric process was a success or not. At the London mine there is a stir of business and excitement, it is said, equal to old times and a grand flourish of prosperity is being had there. Al. Branson, the former owner of the mine, is the big chief, having charge as superintendent of the whole business. In addition to the mine and its responsibility, Branson has a store well supplied with goods which will furnish the laborers at the mines and their families with the necessaries of life, This mine will probably give employment to fifteen or twenty persons. The Quartz mountain mine is about the same character of works as the London, and are using the same kind of machinery. It is currently reported that a fine body of ore has been struck in this mine, and the company or stockholders are very much elated at the prospect. The two last named mines have been in operation but a short time, and the two amounting to twenty stamps ought, to nearly make up for the loss of the Yosemite mill and No. 9 mine which suspended nearly a year ago. In the same neighborhood is the Duncan mine with a five stamp mill which has been in operation a portion of the time for the past year. The mine once had a high reputation and was considered a first-class mine. Jerome B. Brown, we believe is the owner and has it covered with a U. S. patent. He has probably owned and claimed more mines in that neighborhood and done less of profit with them, than any man or miner in that section. The Enterprise mine, near Hornitos, belonging to R. W. Barcroft and a few others, has a fine stamp mill, put on by Mr. Barcroft. Since giving the mine a fair test they have been grinding custom rock, some of which has paid well. We do not know whether it is in operation at present or not. That neighborhood is threaded with quartz veins and it would seem that a custom mill ought to pay well. On the north side of the Merced river, above Coulterville, is the Red Cloud mine, from which most favorable reports have been received of late, It is said they have struck a bonanza in this mine and the ore taken out is fabulously rich with gold. This mine had been lingering along without any remarkable prospect for a long time, when all at once the owners were suddenly crowned with success and made rich. This simply illustrates the fact, that indomitable energy and perseverance is frequently rewarded in mining as well as other enterprises. The Bander mine has undoubtedly experienced a greater outlay of capital than all the mines of the country put together. We are informed that a fine body of ore has been found and is being taken out and placed upon the dump at the mill for crushing. If the same degree of energy and determination to find a rich body of ore in this mine is continued, as in the past, we believe the owner and management will yet be rewarded for their labor and capital invested. In former times the mine paid largely and there appears no reason why it should not pay again.

Nevada.

ACCIDENTAL STRIKE IN QUARTZ.—Nevada *Transcript*, June 20: Warren H. Pierce lives on Bear river near You Bet station, this county. Every winter and spring for several years past he has hydraulicked in a small way on a portion of his ranch through which a small gravel channel extends. Two or three weeks ago the ditch that conveys water to his claim broke, and the water ran off at right angles with it, over the edge of the hill. The water that escaped cut a channel through the soil exposing a decomposed quartz ledge that was never before known to exist there. He has dug a hole in that ledge three or four feet square, and has realized about $1,000. He will sink a shaft this summer and prospect the deposit. Four or five years ago a company erected hoisting works on another ledge in the same neighborhood, but did not meet with success and suspended operations.

MINING PROPERTY BONDED.—*Tidings*, June 19: The Alpha and Golden Gate quartz mines, located about 1,000 feet north of the famous Idaho mine, have been bonded by a San Francisco company through the instrumentality of A. C. Springer, and work on those mines will be commenced about July 1st. The two mines have been consolidated and are reckoned as among the best mining claims in the district. This is a most important mining transaction for this part of the country.

LONE TREE MINE.—Work on the Lone Tree quartz mine is progressing rapidly under the direction of John Townsend, The tunnel has been almost entirely refitted and cleaned out, while several good looking quartz veins have been exposed in the shaft. Mr. Sevenoaks, one of the purchasers of the mine, expresses himself as being entirely satisfied with the affair, and looks forward to a paying mine at no distant day.

Shasta.

HAULING ORE.—Shasta *Democrat*, June 17: Wm. Hiatt is engaged this week hauling ore from his mine near Quartz Hill for Seman's mill near Churntown for crushing. The vein has been struck in the Whitton & Small mine, which shows an excellent quality of rock, "enthoosing" the owners to no little extent. Lem Williams, of Copper City, says the mill at that place is now turning out silver bricks 850 grains fine. This is certainly a very high result from such base ore as the company has to treat. Any one wishing to see fabulously rich deposit of gold quartz in place should visit the Schearer & Rattler mine on Salt creek. A visit to this mine will repay the curious, and the lucky owners will be pleased to show it to any one. On account of scarcity of water the mill on the Brunswick mine in Deadwood district has been closed down, but work developing it continues. The last run of ore averaged $14 a ton. Taking into consideration the size of the ledge, which is large, this mine with a good stamp-mill ought to yield big money.

Sierra.

LOGANVILLE DISTRICT.—*Tribune*, June 20: A light mantle of snow covered the ground Wednesday morning. Charles Qurollo & Co. are cleaning up their mining claim. The bright and shining pieces makes one's eyes water. Castanillo & Co. are running their claim night and day. The Marquerite quartz mine is holding the water at the 200 level. They are expecting Supt. Myers every day, and a principal owner from the East. They intend putting in a new pump. Wm. Swan has been up at the ledge called the Northern Belle; he took out some handsome rock that prospects $40 per ton. S. Stephenson and J. Hutchinson will have their mill running and crushing quartz in a few days.

BIG STRIKE IN QUARTZ.—A rancher named Pearson has struck a rich quartz ledge at St. Charles Hill, a couple of miles below Goodyear's bar, on the Yuba river. A party who was up from there yesterday, says that the rock taken from the ledge is completely lined with gold and that considerable excitement exists in the neighborhood over the find.

NOTES.—There is considerable of a boom in quartz mining at Poker flat. We are informed that prospectors are camped all over the hills in tents and brush houses. Samuel Rey, of Gilroy, and J. Sevenoaks, of San Jose, arrived in Downieville Wednesday, and will spend a few days in looking at quartz mines in this section. The former gentleman mined in this county in '52. Rich quartz has lately been discovered in Reiss ravine and a number of locations have already been made by parties. We are informed that that section is a perfect network of quartz veins, and that many of them will undoubtedly prove rich when they are properly opened out. The Huntington Centrifugal quartz mill, which is being put up on the Lindsay ledge, at Poker flat, will be in order to commence crushing this week. If this mill works satisfactorily the parties will put up another one on the same ledge in a few weeks. The Lindsay mine is very highly spoken of by parties who have seen it, and we look for some good returns from there.

OSCEOLA QUARTZ MINE.—Sierra *Tribune*, June 19: The above named ledge is situated a few hundred yards out of Alleghany, on the north side of Kanaka creek, and is the property of Theodore Smith. The vein is a large one, measuring six or seven feet in many places. Three tunnels have been run in the hill on the ledge. The upper one of the tunnels is in a distance of 30 feet, the second 50 feet the third and lower one about 80 feet. The lower adit taps the vein between 300 and 400 feet below the highest croppings of the ledge. Mr. Smith proposes to push ahead developments on his ledge just as fast as he is able to, and he hopes after awhile to have something to show that will astonish the neighbors. One thing we failed to mention above is the supply of water at hand in Kanaka creek, which could be utilized for mill power. This latter is a very important item when it comes down to figuring on running a mine on an economical basis.

Trinity.

SHORT SEASON.—Trinity *Journal*, June 20: Miners generally are about completing the cleaning-up process. Trinity county never had such a short hydraulic mining season and it is fervently hoped never will have again. As a rule the claims paid well for the amount of work done, and the miners are by no means discouraged. All will rig up in good shape and "play for even" next year.

SATISFACTORY.—A partial clean-up at the Ward mine, on Oregon Mountain, shows that the gravel there contains a fair proportion of gold and indicates certainly that the season's work will be profitable though short on account of the limited water supply.

PAYING WELL.—Messrs. Day, Moore & Co. made another clean-up this week at their arastra at the Enterprise mine on East Fork with most satisfactory results. This mine has paid largely ever since it was struck and maintains its reputation for richness.

NEW RIVER.—Shasta County *Democrat*, June 17: A few days ago we met an old resident miner of Grass Valley, who had been to New River and was returning home, of whom we gleaned a few items: He found that there were about ten quartz mining operations going on in the district, one company having a 5-stamp mill, the others reducing their rock with arastras. About 5000 people had been in the district, first and last, and several hundred are there at the present time. The country is exceedingly rough, being broken into canyons, and not a great deal of level land. New River heads at Scott mountain, and along its broken slopes the mines are situated. The houses that have been put up in the district are generally substantial structures, built of sugar pine, as owing to the heavy snowfall it is necessary to make them strong. The quartz ledges are generally small, but a number of them are paying property. As yet it is an undeveloped country, expensive to live in, and our informant advises persons seeking employment at day's wages not to go there, for they will meet with disappointment.

NEVADA.

Washoe District.

HALE AND NORCROSS.—Virginia *Enterprise*, June 20: The feature of improvement in this mine since last week's regular report has been the good ore development in chambering out for the commencement and hoisting machinery for the winze about to be started on the 3,000 level to explore the ore body to a greater depth. As before stated, the point selected for this winze is in the south lateral drift from west cross-cut No. 2, and about 15 feet feet from the cross-cut. The ore vein at this point showed the greatest richness and concentrated strength, and the excavating of this winze chamber, 14 feet high by 28 feet wide, shows the vein to be wider and stronger at this particular point than it is 20 feet south or north of it. It is over 20 feet in width, and 10 or 12 feet of it is ore that will probably pay from $150 to $200 per ton. At any rate its real value will soon be practically ascertained, as it is being raised to the surface as often as practicable and shipped to Briggs' mill for reduction. It will take about a week yet before the winze chamber and other arrangements are completed and sinking actually commenced below the floor of the 3,000 level. Meanwhile the capacious airy gallery on the 2,400 level will be completed, connecting the main incline winze with the northwest drift running to the Savage incline. The north lateral drift from cross-cut No. 1, on the 3,000 level, is being actively pushed forward to connect with the lateral drift south from

cross-cut No. 2 and the winze chamber. The addition to the hydraulic pump, doubling its present capacity, will also be made in 30 days, giving positive security against any further trouble from possible increase of water.

CON. CALIFORNIA AND VIRGINIA.—Owing to repairs to the C. and C. shaft during the past week there was an interruption of the regular ore yield from the 1,750 level, being worked on company account, but the dump being full the mill shipments were continued as usual, giving average assays of about $18 per ton. From the 1,200 level of the Jones lease section the usual yield of about 1,000 tons was given, with average assays of about $12 per ton. The old Con. Virginia shaft is to be put in complete repair, and used for ore extraction, ventilation and development of the 1,300 level. Owing to the superior ventilation arrangements and air connections throughout this mine, as compared with former bonanza times when it took five men to a pick, owing to the great heat and vitiated air, a great deal more and better work is being done now than was ever possible before, and far poorer ore can be worked to paying advantage. The repairs to the C. and C. shaft, machinery, platform, etc., will be completed about Sunday, when work will be resumed through it as before.

SIERRA NEVADA.—The main north lateral drift on the 520 level is being steadily advanced in good working ground, 60 feet being added to its length during the past week, making 564 feet in all. No intention of crosscutting west at present.

GOULD AND CURRY.—On the 1,000 level the cross-cut east, near the Savage line, is being steadily advanced in good working ground, and near the north line a cross-cut west has been started to explore the vein in that direction.

WOODVILLE.—The stopes on the 400 level are holding out and promising well, about 10 tons a day being the regular product. This ore is of good grade, and is shipped to the Eureka mill for reduction.

CHOLLAR.—Exploration work has been suspended on the 3,000 level for the present, and the men put to work in the upper workings extracting ore from that point for milling.

CROWN POINT.—The regular yield of low grade ore from the upper levels of this mine, the Kentuck and Belcher continues, with no new features of importance to make mention of.

MEXICAN.—The joint Mexican and Ophir crosscut west on the 500 level is being steadily pushed ahead and another joint cross-cut started east.

OPHIR.—On the 500 level the upraise to connect with and drain the old Mexican shaft is progressing upward at the rate of about 20 feet a week.

YELLOW JACKET.—Nothing new to relate. The old stopes and chambers of the upper levels continue yielding plenty of low grade ore.

OVERMAN.—About 30 tons a day of fair grade ore are taken from the 226 level and shipped to the Vivian mill for reduction.

BALTIMORE CON.—Work is suspended in the mine at present, owing to the needed repairs to shaft and machinery.

BULLION.—The drift west on the 160 level still advances in promising vein porphyry and quartz.

ALTA.—Still yielding small bunches of good ore from the explorations above the 900 level.

Esmeralda District.

AURORA'S PROSPECTS.—Walker Lake *Bulletin*, June 20: A. E. Ann, the representative of an English syndicate, accompanied by W. Gaffany and P. N. Mackay, mining experts, returned from Aurora yesterday, where they have been, for the past week, examining some mining property, and it is believed, with a view of purchasing. They speak favorably of the mines, so far as investigated. The principal properties examined were the Silver Hill, Humboldt, Junietta and Esmeralda mines.

Osceola District.

GOLD.—Salt Lake *Tribune*, June 20: The Salt Lake stockholders of the Osceola Gravel Mining Company, who went to Osceola recently to witness the first clean-up returned last Thursday evening. Mr. J. R. Walker, one of the party, was accosted by a reporter soon after their arrival, and kindly gave a full account of the trip and the progress that is being made with the hydraulic monitor. No clean-up was made while the Salt Lake men were there as the bedrock has not yet been reached, and until it is reached it will be impossible to get the coarse gold which sinks down in the rocks. The clean-up will probably not be made for some weeks. Both Mr. Walker and Mr. Lawrence pronounce the new ditch the finest they have ever seen. It is seventeen miles in length, including a mile of flumes, and is supplied with water from five streams. These streams flow from a high range of mountains, upon which snow remains during the entire Summer, and the water supply, therefore, will not be materially decreased during the summer months. The ditch is at present carrying 1,000 inches of water, and 500 inches more are available. The bed of the ditch is hard gravel cement, which holds the water admirably. Its construction cost in the neighborhood of $100,000. The force of the stream thrown upon the gravel banks is said to be terrific, as 800 inches of water, with a fall of 350 feet, is forced through a 6½-inch nozzel. A smaller monitor will soon be put in operation below the large one, as the water can be used a second or third time, provided there is any placer ground below the present workings; the company owns altogether about 1,000 acres. While the Salt Lake party were there a temporary sluice-box was constructed and eight men were set to work shoveling dirt into it. They worked four hours and sixteen pennyweights of gold, or nearly $2 to the man, was the result. When it is considered that the monitor brings down a ton of dirt as quickly as a man can lift a shovelful, that there is an unlimited supply of water and almost inexhaustible gravel banks which are rich in gold, there seems to be no reason why wealth should not roll into the coffers of the Osceola stockholders. All of the gentlemen who went down are entirely satisfied with the prospects of the enterprise.

Sprucemont District.

THE FURNACE.—*Free Press*, June 19: From ex-Sheriff Taber who returned on Monday from Jasper, Sprucemont District, we gather the following items in regard to the new smelting furnace recently erected at that place. The furnace started up on the 27th of May and has been running steadily ever since, reducing about 14 tons of ore daily, and producing about $400 worth of bullion for each day's work. There are now over 600 tons of ore at the furnace and about the same amount on the dumps at the mines, which are situated three miles from the smelting works. There are also some 50,000 bushels of charcoal and 25 tons of coke at the furnace. The furnace is of 20-tons capacity, and employs 16 men. It is working finely, and is under the personal supervision of Mr. Andrew Harrell, with Mr. Small as foreman. There are 16 men employed at the three mines—Scorpion, Friday and Belt—operated by the company. Most of the ore comes from the Scorpion mine, though considerable work is being done on the other two. The Belt is being worked mostly for the lead ore it contains. Mr. Wardwell, who has the contract for hauling the ore from the mines to the furnace, has two teams running, and is delivering 20 tons of ore daily. He makes two trips each day—10 tons to the trip. The road between the two points is in good condition and of easy grade. The town of Jasper, where the furnace is, has become quite a little burg. There are now within its limits 2 eating houses, 2 saloons, 1 general merchandise store, 1 drug store, 1 butcher shop, 1 livery stable, and seven or eight families. A petition for a post-office and mail route has been forwarded to Washington, and in due course of time the citizens of Jasper will have mail communication with Wells, on the Central Pacific, 40 miles distant. Everything needed—fuel, timber, water, etc.—is handy and there is nothing in the way to hinder the furnace from running successfully, and the prospects for Jasper and surrounding country are exceedingly flattering.

ARIZONA.

KINGMAN.—Wallapai *Tribune*, June 20: Since January 1, 1885, there has been more ore shipped out of this district than a casual observer would suppose. The statement furnished us by the gentlemanly agent of the Atlantic & Pacific at this place, J. F. Brooke, shows that there has been 2,040,560 pounds of ore shipped up to June 16, or 1,020 tons. Of this amount Beecher & Co. shipped 268,842 lbs., W. H. Taggart & Co. 647,587 lbs., and we presume that J. W. Chamberlain shipped the balance, or 1,121,131 lbs. This shows a very healthy state of affairs in this district, more so than ever before, as all the ore shipped has paid well, whereas, last year a great deal of ore shipped did not pay expenses. The greater part of this ore has been taken from the vicinity of Stockton Hill, which is destined to be one of the liveliest camps on the Pacific Coast. 1,020 tons in five and a half months is a pretty good showing for a district that two years ago could not supply a 5-stamp mill with enough ore to keep it running three months in the year. Captain Hardy informs us that during the coming months the shipments will be largely increased. From the old dumps of the Cupel mine over 42 tons of good ore, running over 100 ozs. silver, has been sorted out by Messrs. Riley & March, and perhaps as much more will be extracted before the dumps are worked out. In place of the Schuykill, New London and Champion which produced so much last year, hundreds of claims that were then lying idle are now being or are about to be worked, those being worked producing a higher grade ore than has ever before been taken from them. Work has been suspended on the Lorena mine, on account of the large amount which has to be handled in its operation. Henry Raymond has six men at work on the Hibernia line, and has a pack train engaged in packing the ore to Yucca as fast as it is extracted. It is rumored that the Cerbat mill and mine will start up shortly with H. S. Carpenter as superintendent. We sincerely hope that this rumor will prove true. N. Amer brought three tons of ore down from the Silver King mine Wednesday, which he had worked at the sampling works. We did not learn the result. Joe Pomber and Joe Prisk are taking out some very rich ore from a claim situated between Todd Basin and Layne Springs, samples from the claim assay as high as 900 ozs. per ton. John Hughes and William Davis are sinking on the Constellation mine, situated about 1½ miles southeast of Cerbat, and are down about 90 feet. The ore body is improving and some very rich bunches are being struck. Eugene Torlott and John O'Brien have just shipped 5½ tons of ore from the Vanderbilt mine near Cerbat through Beecher & Co. to the Pueblo smelter. The ore will probably average $70 in gold and about 10 ozs. silver per ton. 15 feet of solid ore assaying 70 ozs. has been struck in the Signal mine on the 170-foot level. A cross-cut has been run cutting the ledge, and has exposed to view an immense body of ore. There is considerable excitement over the strike, and a mill will be put up immediately. The mine is owned by Messrs. Kimble Bros. & Co.

COLORADO.

WORK.—Elk Mountain *Pilot*, June 20: Work is progressing although quietly on the Richmond, Tip Top and Lady Joe in Dark canyon; on the Monitor, Great Western and Hawkeye, on Slate river; on the Eastman, P. Islander and Augusta, in Poverty gulch, and on the Daisy, Daisy extension, Chautauqua and High Tide, in Evans basin, besides many prospects in the same localities and a score or more in Irwin and on Rock creek, Brush creek and around Gothic.

POVERTY GULCH.—The Augusta mine will ship six cars of ore next week, which will be about double what it has been shipping. Mr. Gillette expects to ship a car a day regularly when the tramway is erected, up to which time the output will be from two to five cars a week. A force of 11 men are at work on the Tip Top mine in Dark Canyon. It is owned by the same company as the Richmond and will be systematically developed.

IRWIN.—Work on the Fairview, Forest Queen and Bullion King is being prosecuted with satisfactory results. The King shaft will be sunk as soon as surface water stops coming in so rapidly. Work will be begun on the Ruby Chief mine the first of next week to get the mine in shape to ship steadily. A new track of "T" rails will be laid in the tunnel and everything arranged for extensive working.

REDWELL.—The Grand Union mine in Redwell basin is developed by a tunnel 60 feet deep at which point it cuts the vein. Drifts have been run 30 feet in each direction on the vein which shows large bodies of ore, carrying lead, and a small percentage of zinc. No work has been done on the mine this winter, but Mr. Fitzgerald, one of the owners, has arrived from Silver Plume and informs us that work will soon be commenced upon it. It is one of four claims owned by Messrs. Fitzgerald, Miller, Burr and Faas, all of which will be worked through this tunnel. The Daisy lode in Redwell basin has been leased by the owners, Messrs. Fitzgerald, Miller, Burr and Faas, to W. H. Wilson, formerly of the Chrysolite mine in Leadville, and a Mr. Lawson of Socorro, New Mexico. The property will be worked continuously after starting which will be soon.

CRYSTAL CITY.—The Orphan Boy M. & R. Co. have started work upon the Silver Falls which shows a strong vein crossing Lost Trail creek, that carries copper and galena. The Detroit is being worked by the Squire also other claims which he is interested in. Andy Anderson has been doing work upon his Sheep Mountain property.

ORE.—Georgetown *Courier*, June 20: The Pelican-Dives is producing more ore than for a number of years previous. Nearly 60 men are employed. A 25-horse-power engine and pump will probably be placed on the Aliunde. The water at present greatly interferes with development. Extensive placer operations are being made in the vicinity of Breckenridge this summer. It is reported that another smelter will be erected near Idaho. Allen & Campbell are the projectors. The last shipment of ore from the Centennial consisted of nine tons, and returned $57.50 per ton. During the month of May 49 cars or about 700 tons of ore were shipped from the Georgetown depot, valued at $91,000, 16 of which went to Argo, 4 to Golden and 29 to Denver. The Terrible mill has been running steadily with satisfactory results, since the latter part of April, turning out about $1,000 worth of concentrates per week. Between 25 and 30 tons of raw material is treated daily.

IDAHO.

PLACERS.—Idaho *World*, June 20: This promises to be a better season than usual for placer miners. Water will hold out almost, if not quite as long as last year—and last season was good for water—and this year's work was commenced about a month earlier than last. George Cartwright, who is working placers in Campbell's gulch, in partnership with Jas. Hall and Wm. Barker, and is also interested with Riordan & Co. in ground between Noble and Campbell's gulch and in the Thorne creek ditch, says work will be carried on for sometime yet in both of these claims. Work was stopped in said claims the latter part of July last year. The Ritchie boys are still at work in their hydraulic claim between here and the Warm Springs, Plowman will have water for a few weeks yet. Buzzini & Co. have a number of large reservoirs, and by "corralling" the water can work twelve hours out of twenty-four until fall. A portion of this season this company has not been working as good ground as formerly, but it paid fairly. Recently they came onto ground that is as rich as that they have run off during previous seasons. Jo Hill, who gets water from the Thorn creek ditch, owned by Riordan & Co., stopped work about ten days ago. The Riordan Co. had no water to spare. A number of other claims on this side of the Basin are still running.

BONANZA.—*Courier*, June 20: Thursday we visited the Schearer & Radler bonanza in company with A. McConnell, Col. Magee and Alex Morland. The find is situated in a short "wet weather" gulch which puts into the Sacramento just below the mouth of Salt creek, and a few hundred yards below the Middle creek depot. The ledge matter is about six feet in diameter both horizontally and perpendicularly, and rests between well-defined walls of slate. The main body of quartz is of dark grayish hue, so hard as to almost bid defiance to drills, and pitches down under the hill at an angle of less than forty-five degrees. The very rich streak runs at present horizontally across the ledge and is from six to eighteen inches in width and contains a combination of gold and tellurium so rich that when the formation is broken it holds together as though it had been interwoven with wires and threads of gold—and so it has been by the deft hand of Nature. The incline sunk on the ledge is about 18 feet in length and the base of the face on the lode not over 15 feet, we should judge, from the surface. Enough has already been taken from the lode and is in sight, to ensure its lucky owners a fortune. John Langdell, of Bowlder, Colorado, has been installed superintendent of the mine and carefully selects the ore taken from the very rich pay streak and separates it into three grades. The entire ledge matter is highly mineralized and what is classed as the poorest rock will go $2,000 to the ton.

BULLYCHOOP.—Whit George, of the Bullychoop mines, came to town Monday, having disposed of his mining interests in that district. Whit informs us that the Foster & Potts toll road is now completed to within three miles of the principal mines in that camp, consequently the whole road will be open to travel in a short time. He says for a mountain road it will be one of the best thoroughfares in the country. Upon the completion of this road two or three mine owners intend to erect milling machinery on their property. Whit thinks Bullychoop will be a lively camp this summer.

MONTANA.

BUTTE SMELTING CO.—*Inter-Mountain*, June 18: Work has already begun upon the new custom smelter on Silver Bow creek at the foot of Montana street. The furnace will be a cupel having a daily capacity of 60 tons. The Parrot company has nothing to do with the new enterprise, though several of the Parrot stockholders are identified with it. Mr. Murphy, who is now the assayer at the Parrot, will have charge of the new works. The name of the organization will be the Butte Smelting Co. It will smelt silver or copper ores at custom rates, or buy them at the smelter according to sample. The product will be a matte, carrying about 25 per cent copper, with varying proportions of silver. It is contemplated to have the works ready to begin operations on smelting ore about the 1st of August. No concentrator will be built at present.

BUTTE MINES.—*Miner*, June 20: Ground has been broken for the foundation of the new smelter, which is to be erected at a point south of the depot. The machinery for the smelter will be on the ground by the first day of July, by which time it is hoped that sufficient progress may have been made on the structure to begin the placing in position of the machinery. The capacity of the smelter will be 100 tons per day. Mr. Gaylord, the present manager of the Parrot Co., will be the manager. Mr. Murphy will be the superintendent, and Mr. McArthur, one of the furnace bosses of the Parrot, will have charge of the smelting department. The Colorado smelter is running to its full capacity. It is contemplated to add shortly another calcine furnace to their already large establishment. The mines in the Burlington district seem to improve as depth is gained. Machinery is now being erected on the Patsy Clark group of mines. When completed the group will give employment to a great many miners and laborers. The Montana Copper Co. will shortly commence the erection of another furnace and stack. The shaft of the Colusa is being sunk to a depth of 800 feet, where it is expected a rich body of ore will be struck. The mine is one of the largest producers in the camp. No stoping now. The Anaconda is shipping from 450 to 500 tons of ore daily to its smelter in Anaconda. It is reported that the mine will be worked to its fullest capacity. Very little ore is now being taken out of the stopes. The Moulton stamp mill and mine are working day and night with the usual amount of ore. The Little Darling is producing some very rich ore, and will shortly be worked to its full capacity. The mine is a little darling, indeed. The Gagnon is producing its regular quota of ore, and shows up some fine bodies in the drifts and stopes. They are shipping some 26 and 30 tons a day to the Colorado smelter. Rell's stamp milling company is treating all the output from their mine, which is producing a high grade ore. The Parrot smelter will shortly be enlarged, as the company contemplates putting in a new furnace of a 100-ton capacity. This company is now mining and treating over 300 tons of ore per day, all from their mine, the Parrot. The Lexington people have just completed and set in place their new set of boilers, which will give them additional hoisting facilities. The mill and mine are worked to their full capacity, producing over $80,000 per week. The Alice is working to its full capacity. The company is putting in a new set of boilers. It is expected that the Bluejay mine, in the Burlington district, will start up in a few days. Burlington is shortly to have a stamp mill, as parties are looking out for a location.

NEW MEXICO.

ORGAN.—Rio Grande *Republican*, June 20: The concentrator is doing some good work at the Silver Gem. Work still continues on the Silver Star. Clark and Brown are still at work on the Wilde Oscar. A few men are at work on the Galloway, and are taking out some fine ore. A cave was struck in the Bennett mine seventy feet deep and a hundred feet long. It is reported that the ore in the cave is very rich.

GOLD HILL.—Cor. Silver City *Enterprise*, June 16: Since my last unusual activity has been the order of the day, and claim owners wear smiling faces accordingly. The day of regeneration is at hand. Since the advent of western mining men who have the experience and funds sufficient to back their judgment, no fears need be entertained for the future of Gold Hill. It is only a question of time when an express office will be needed here to handle our bullion and cash our checks. The mining outlook never was better nor have we any recollection of the time when California men were so eager to invest in New Mexico mines as at the present time. Parties are expected in here shortly from Tombstone, and also from Kansas City, both having in view the purchase of mining properties. Claim owners have awakened to a realization of the fact that mine prices cannot be obtained for prospect holes, and are willing to change their figures accordingly.

OREGON.

THE BIG YANK.—Oregon *Sentinel*, June 20. This much talked of mine at Galice creek has now taken a boom, and with present indications will soon astonish the natives with its richness. While at Grant's Pass this week we learned that the California parties who had it in bond, had ordered prospecting stopped, being well satisfied with assays made from numerous portions of the mine, and declare their intention of taking the mines for the amount of the bond. A large stamp mill has been ordered and it will not be long before Galice creek will be one of the liveliest mining camps ever found on the Pacific Coast. Prospecting on other ledges continues and rich discoveries are promised from other well-known ledges in that section.

PROSPECTING AT WOODVILLE.—About 18 months ago, while I was hunting, I picked up some favorable looking quartz, and after looking some time I found the ledge and gave a party half interest to put on the first year's assessment. After working some time and the ledge seeming broken, work was suspended and nothing has been done with it since. I received assays from J. H. Fisk of the rock, none less than $40 and some as high as $150 to the ton carrying some silver. About the same time Dr. Studney and W. J. Stanley located what is known here as the old copper lode one and a half miles below Woodville. Though the ore is not high grade it will no doubt be a paying mine. The ledge runs about 10 degrees east of north. Having received information from T. D. Jervitt last spring during his stay in Woodville, that some rich silver ore had been found in this locality, I encouraged O. Boyd an old Colorado prospector to spend some time looking for the ledge. He soon found some good float ore and a small vein running 100 ounces in silver. After looking at the ground, he located on a ledge running quartering across the small vein. The ledge is called the Oliver Boyd and runs 20 degrees west of north, and lays between porphyry and granite, and the owners think they have a bonanza. The Little Galena owned by Otto Lind, H. Kinney and others is about one and a half miles west from the Boyd claim and runs nearly north and south and assays from $25 to $50 in gold and silver to the ton. On upper Grave creek about 20 miles from Woodville, the Blalock Bros. have a large and promising ledge running northwest and southeast. The assay shows 20 per cent copper and from $8 to $16 in gold and silver. Samples of ore from these ledges can be seen at T. T. McKensie's of your town.

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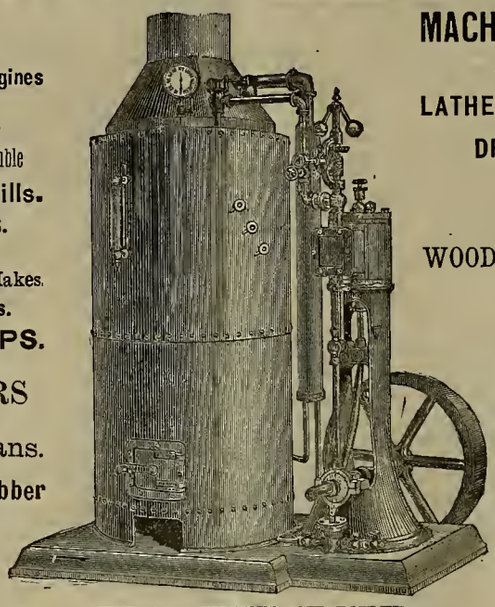

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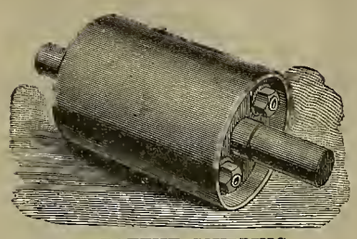
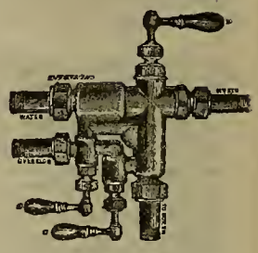


PATENT COUPLING.



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NOTICE TO ARCHITECTS.

$250 for Plans.

THE DIRECTORS OF THE INSANE ASYLUM OF Arizona propose to erect an asylum of sufficient size and capacity to accommodate 100 patients, near the City of Phœnix, in Maricopa county, Arizona Territory, and for the purpose of obtaining plans and specifications suitable for such an institution, hereby make the following offer to Architects, namely:

FIRST. The Directors will receive plans and specifications offered by Architects, and place on file with their Secretary, N. A. Morford, at Phœnix, Arizona, on or before the 3d day of July, 1885.

SECOND. On said day, or as soon thereafter as practicable, the Directors will examine all the plans and specifications offered, and if any one of them shall be approved by the Directors and adopted for the construction of said asylum, they will pay to the party offering the same, two hundred and fifty dollars; but the Directors reserve the right to reject all plans and specifications offered.

THIRD. The material to be used in the construction of the buildings will be brick, iron, and wood, unless some different material shall be found which is more desirable and which can be supplied for an equal cost.

FOURTH. The cost of the whole construction must not exceed $45,000.

FIFTH. The buildings must be complete in themselves, but so arranged that their capacity may be largely increased with facility by additions without changing or removing the structure.

SIXTH. The prices of material and labor at the site of the building will be approximately as follows, viz.:

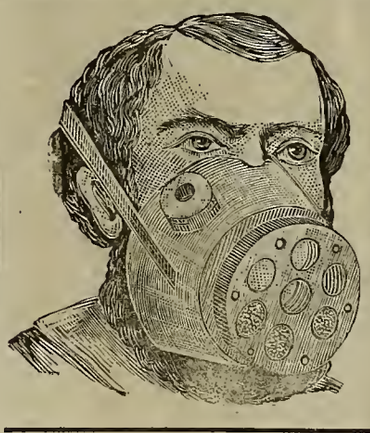
Lumber per M., finishing and flooring	$65 00
Lumber per M., rough	45 00
Brick laid in wall, per M	14 00
Rockwork for basement, per perch	3 50
Iron, per lb	4c
Lime, per 1,000 lbs	2 00
WAGES. Carpenters, per day	4 00
Bricklayers, per day	5 00
Laborers, per pay	2 00
Painter, per day	4 00
Plasterer, per day	5 00

SEVENTH. The climate is temperate, but the mercury ranges high during about three months of the year, and then it drops to the freezing point in winter, occasionally, and hence provisions must be made against extremely warm as well as cold weather. The temperature ranges approximately as follows:

	Maximum, Means for 1884.	Minimum, Means for 1884.
January	70.1	31.1
February	70.5	34.5
March	76.1	32.9
April	85.2	40.8
May	03.4	49.1
June	103.4	55.7
July	109.0	66.3
August	104.2	63.2
September	89.9	48.3
October	93.0	51.3
November	83.2	40.1
December	67.8	36.1

All plans and specifications sent by mail or express must be prepaid and marked "Plans and Specifications for an Insane Asylum," and addressed to the Secretary of the Directors of the Insane Asylum, Phœnix, Maricopa County, Arizona.

Plans and Specifications will be returned, if required, on receipt of cost of transportation. N. A. MORFORD,
Sec'y Board of Insane Asylum Directors.



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List of U. S. Patents for Pacific Coast Inventors.

[From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.]

FOR WEEK ENDING JUNE 16, 1885.

320,048.—OATMEAL MACHINE—Geo. Cottrell, S. F.

320,049.—GRAPE STEMMER AND CRUSHER—A. David, S. F.

320,054.—MILL STOCK FEEDER—Downie & Eisan, Marysville, Cal.

320,055.—DIRT SCRAPER—Dusy & McCall, Selma, Cal.

320,066.—FLOOR AND SIDEWALK CONSTRUCTION—P. H. Jackson, S. F.

320,077. FEED WATER HEATER—Geo. H. Malter, S. F.

320,082.—FAN ATTACHMENT FOR VEHICLES—R. Meacham, Chico, Cal.

320,382.—CAR AXLE LUBRICATOR—R. Munro, S. F.

320,285.—ELECTRIC IGNITER FOR GAS ENGINES—D. S. Regan, S. F.

320,201.—VEHICLE AXLE—Charles Wonacott, Bishop Creek, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise,) at the lowest rates. American and Foreign patents obtained, and all patent business for Pacific Coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

OATMEAL MACHINE.—Geo. Cottrell, S. F., No. 320,048. Dated June 16, 1885. This invention relates to that class of machines for cutting oats to form oatmeal or grits, in which a shaking movable screen is employed in connection with an underlying cutter-head; and the invention consists in a combination of devices for accomplishing the object.

BOILER TUBE EXPANDER.—Michael Cashin, S. F., No. 319,559. Dated June 9, 1885. This tube expander consists of a cylindrical block divided into sections and carrying rollers, a centrally inserted wedge, and a screw for adjusting it to expand the block, an encircling spring to act against the wedge and bold the block together, suitable guides for the expanding block, and a lever, pawl and ratchet mechanism for turning block, together with certain details of constructions.

FAN ATTACHMENT FOR VEHICLES.—Randall Meacham. Chico, Butte Co., Cal. No. 320,082. Dated June 16, 1885. This is an attachment for buggies, carriages and other vehicles intended for general riding purposes; and it consists in a fan mounted in the top of the vehicle, and operated by power transmitted from the wheel. The object is to make riding in warm weather and over dusty roads more pleasant by creating a constant breeze or circulation of air within the vehicle.

MILL-STOCK FEEDER.—Geo. Downie and Albert F. Eisan, Marysville, Yuba county, Cal., No. 320,054. Dated June 16, 1885. The object of this automatic feeder is to supply mill-stock to a grinding, separating or purifying machine. The invention consists in a feed-board, mounted, which is connected with a purifier or rolls, as the case may be, said hoard being located under the hopper and adapted to feed the middlings and stuff into the shaker, by which it is discharged into the machine with which it is connected.

BOLTING REEL.—Francis Ferrier, Vallejo. No. 319,572. Dated June 9, 1885. This invention relates to a new and useful sieve for screening, bolting or sifting any substance, and particularly to that class of sieves used in bolting flour, and known as flour-bolt reels. It consists of a corrugated sifting surface and in the means for obtaining it in a flour-bolt reel. The object is two-fold; first, to be able to obtain a maximum sifting surface in a minimum space; and second, to produce a vibratory motion of the sifting surface by reason of the corrugation.

VEHICLE AXLE.—Chas. Wonacott. Bishop Creek, Inyo Co. Assignor of one half to J. H. Bulpit. No. 320,201. Dated June 16, 1885. This consists first, in a supplemental sleeve, which is fitted upon the spindle so that it receives all the wear, and may be removed and replaced by a new one when worn out. It also consists in a peculiar construction of the inner end and shoulder against which the box on the wheel-hub turns, in a disk secured to the inner end of the box within the end of the hub, and in a means of discharging any sand or dirt which may work itself inside the disk.

FLOOR AND SIDEWALK CONSTRUCTION.—P. H. Jackson, S. F. No. 320,066. Dated June 16, 1885. In the construction of basement extensions it is important to obtain all the head-room possible, and for this purpose, when on account of water or other reasons it is not feasible to dig deep, expensive iron sidewalks are used to avoid the deep brick or concrete arches which would otherwise have to be built, and which would he so low as to greatly interfere with the usefulness of the space beneath. In Mr. Jackson's improved construction he dispenses with the usual continuous brick or concrete arches which support sidewalks, and gains the room they take up in hight, the sidewalks being of the usual thickness. The vault beams may be also made lighter and at less cost, there being no heavy, continuous brick or concrete arches to be sustained by them, and which from their depth would occupy space which in Mr. Jackson's construction is made available.

GRAPE-STEMMER AND CRUSHER.—Auguste David, S. F., No. 320,049. Dated June 16, 1885. This consists in a casing or sbell on which is mounted a rotating shaft carrying a series of spirally-arranged arms, a hopper adapted to feed the bunches of grapes to the arms, and underlying laterally-concaved grating through which the grapes pass; a series of parallel spaced bars on the under surface of the swinging cover of the casing against which the arms beat the stems, a horizontal screen under the grating, a chute under the screen, and suitable crushing rolls under the chute. The patent also covers certain details of construction relating to the points of feeding and discharge.

PATTERN-MAKING MACHINE.—Carlos Tourigne, S. F. No. 317,687. Dated May 12, 1885. This is a machine for laying or cutting out patterns, either directly from the object to be fitted, whether of a curvilinear or plane surface, or from another pattern. The invention is applicable to the making of all patterns, but is more particularly intended for laying or cutting out the pattern for uppers of shoes, so they may be conformable to the last in every particular, either measurement for measurement or proportionately. The invention consists in the employment of a string, cord or other flexible line, so mounted and guided and centered as that one end may be made to follow the outline of the body while lying upon and moving over in perfect parallelism with its curvilinear surface, and its other end may receive motion from the first end to register or indicate its movements, thus delineating them both in outline and measurement and forming the pattern. The invention further consists in a suitable frame, an adjustable last-holder, a movable and adjustable string-holder on one side and a movable and adjustable pencil or knife holder on the other, a mechanism for transmitting the movements of the string to the pencil or knife, a means for proportionately altering the movement of the pencil or knife, a swinging table for the work, and various details of construction.

Mining Share Market.

Now that Hale and Norcross is raising ore and shipping it to mill, with prospect of more to come, there is a more hopeful feeling among those who pin their faith on the Comstock.

Speaking of bonanza indications, the *Enterprise* says, the ore vein on the 3,000 level of Hale and Norcross has been more irregular and variable than where it was found on the levels above, from the 2,600 level down. It has increased in width, general size and volume, so to speak, yet at the same time has shown more disposition toward concentration in large bunches or bodies of richer ore. These bunches are connected, yet show eccentric turns and variations, whirling away to the westward unexpectedly or bulging or enlarging to the eastward. Superintendent Patton, whose well-known and eventful experience in the development and working of the bonanza mines of the north end gives his opinion more than ordinary weight, considers the irregular features above related as of the most favorable character for the development of a first-class ore body or bonanza. In fact, his opinion is corroborated by that of other observant and experienced men. It simply shows a disposition of the ore-bearing vein matter to abandon regularity of stratification and concentration at some point in the great ore channel. The general character of the inclosing walls or surroundings at this point of depth indicates increased strength of body and mineralization apparent nowhere else along the whole Comstock lode at a similar depth.

Within the next thirty days the duplicate, or other half-section of the big hydraulic pump in the Combination shaft, already in course of construction in San Francisco, will be received and placed in position, thus doubling the drainage capacity.

The low grade ore bonanzas of the north end as well as of the south end continue their regular daily yield, and development and exploration work is going ahead all along the lode as usual.

Bullion Shipments.

Clip, June 16, $3,550; Christy, 16, $1,578; Hanauer, 16, $2,800; Queen of the Hills, 16, $1,300; Honerine, 17, $5,100; Hanauer, 17, $5,600; Queen of the Hills, 19, $1,200; Hanauer, 19, $5,800; Ontario, 19, $25,590; Christy, 19, $1,703; Queen of the Hills, 20, $1,300; Hanauer, 20, $2,600; Stormont, 21, $2,780; Hanauer, 20, $2,450. The banks of Salt Lake City report the receipt for the week ending June 17, inclusive, of $22,958.52 in bullion and $9,700 in ore; a total of $32,658.52.

AXLE LUBRICANT.—Those who have not yet used the plumbago lubricant of the Dixon Co. for vehicles and machinery, will do well to write J. G. Allen, Sole Agent for Pacific Coast, No. 106 Davis Street, mentioning this notice.

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ASSESSMENT NOTICE.

Gould & Curry Silver Mining Co.

ASSESSMENT NO. 50.

Levied.....June 1, 1885
Due in Office.....July 8, 1885
Amount.....40 Cents per Share
Sale Day.....Wednesday, July 29, 1885

ALFRED K. DERBROW, Secretary.

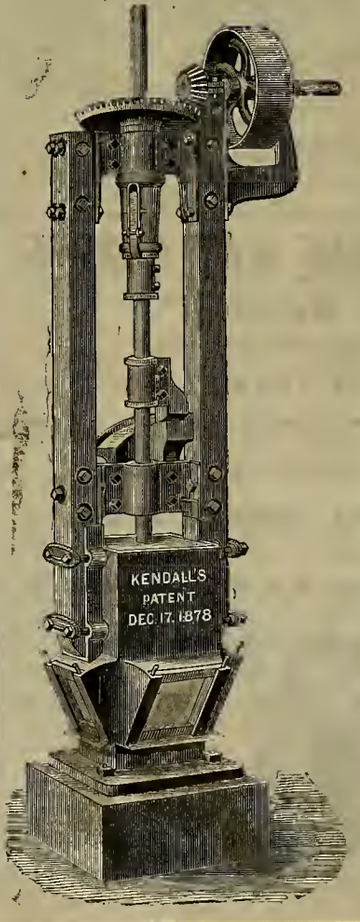
OFFICE—Room 69, Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

DIVIDEND NOTICE.

San Francisco Savings Union,

532 California St., cor. of Webb.—For the half year ending June 30, 1885, a dividend has been declared at the rate of four and one-half (4½) per cent per annum on term deposits, and three and three-fourths (3¾) per cent per annum on ordinary deposits, free from taxes, payable on and after July 1, 1885.

LOVELL WHITE, Cashier.



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Williamson Bros' Hoisting Engines.
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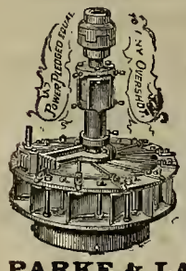

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1 CAMERON PUMP, 12 inch steam and 10½ inch water cylinder.
2 WILCOX PUMPS, 3½ inch steam and 2½ inch water cylinder.
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1 PLUNGER PUMP, 1½ inches.
1 DECK PUMP. 1 SMOKE STACK.
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No. 1 (XX) is the Strongest Explosive Known.
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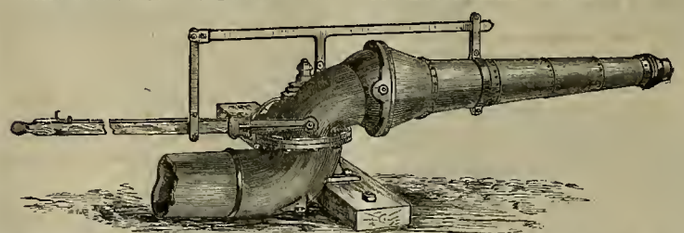

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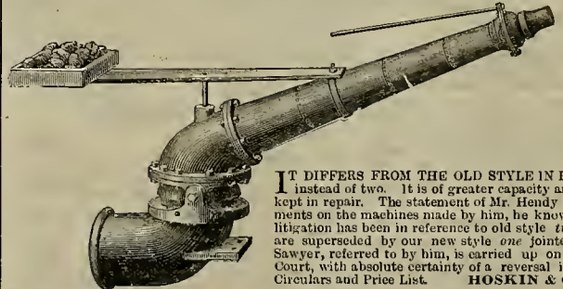

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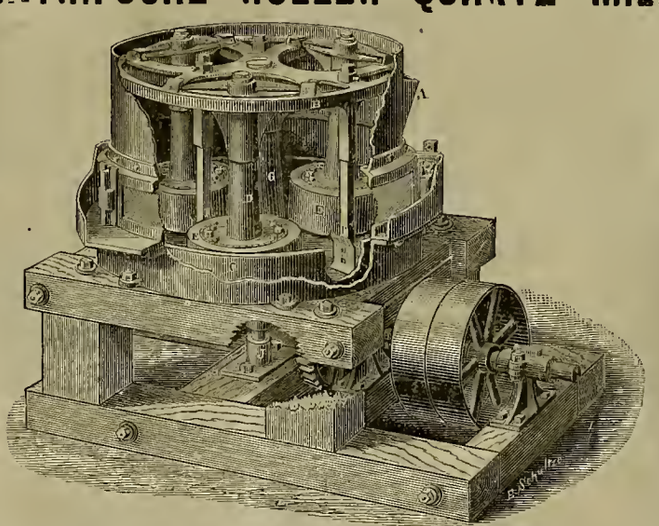

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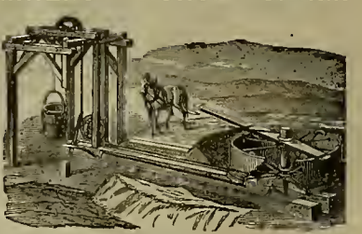

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Lumber at Wholesale.

The Redwood Lumber Association has established no prices since the first of the year.

REDWOOD.—Cargo prices are at present as follows: Rough, merchantable, ₱ M ft., $13 00; Rough, clear and surfaced, $23.00; 1x10 Rustic, No. 1, $24.00; 1x10 Rustic, No. 2, $19 00; 1x8 V Rustic, No. 1, $22.00; 1x6, tongued and grooved, $21.00; 1x4, tongued and grooved, beaded, $23.00; 4-in.x3, Battens (board measure), $30.00; Shingles, ₱ M, $1.65.

Pine—Rough, $15.00; No. 2, $12 00; do do in lengths, $13.00; rough, 40 to 50 ft lengths, $16.00; do 50 to 60 ft, $17.00; T and G Flooring, 1x6, $26.00; do do 1¼x6, $28.00; do do 1x4, $28.00; do do No. 2, $21.00; Vertical Grain T and G Flooring, 1x6, $30,00; do do do 1¼x6, $32.00; Stepping, $37.50; Furring, 1x2, per lineal ft, ⅓ c.

Lumber at Retail.

Prices fixed by the association April 1st. are as follows:

Pine, Rough	$15 00
" " No. 2	12 00
" " " 2 to lengths	13 00
" " 40 to 50 feet lengths	16 00
" " 50 " 60 "	17 00
T. & G. Flooring 1 x 6	26 00
" " 1¼ x 6	28 00
" " 1 x 4	28 00
" " No. 2	21 00
Vertical Grain T. & G. Flooring, 1 x 6	30 00
" " " 1¼x 6, 1 x 4	32 00
Stepping	37 50
Furring, 1 x 2, per lineal foot	0¾
Redwood, Rough	17 00
" " No. 2	13 00
" Surfaced	30 00
" " 1 x 8	28 00
" " 1 x 6	28 00
" T & G. 6 in. 12 ft. and over	28 00
" " " 7 to 12 ft	25 00
" " " under 7 ft	20 00
" Rustic	30 00
" " No. 2	25 00
" T. & G. Beaded 12 ft. and over	30 00
" " " 7 to 11 ft	25 00
" " " under 7 ft	20 00
" Siding, ½ in	22 50
Pickets, Fancy	25 00
" Rough Pointed	15 00
" " Square	14 00
Battens, ½ x 3 per lineal ft	0¾
Shingles	2 00
Laths, 1½	3 25
" 1½	3 75
Dunnage Boards less 5% delivered	16 00

Price subject to change without notice.

Nails.

We give the price list of the Pacific Iron and Nail Company.

NAILS.	
10d to 60d	$
8d to 9d	25
6d to 7d	50
4d to 5d	75
3d	1 50
2d	2 50
BARRELS.	
1½ inch	$0 75
1¼ inch	1 00
1¼ inch	1 50
1½ inch	1 75
1 inch	2 50
¾ inch	4 50
½ inch	6 00
BOAT NAILS.	
¾ inch	$8 00
⅝ inch	6 00
1 to 1¼ inch	5 00
1¼ to 2 inch	4 00
2¼ and above	3 00
Galvanized extra.	
FINE SLUED.	
3d	$3 00
CLINCH.	
6d to 30d	$1 75

SLATING.	
5d	$1 00
4d	1 00
2d	1 75
2d	3 00
FINISHING.	
2d, 1 inch	$6 00
3d, 1¼ "	4 00
4d, 1½ to 1¾ inch	1 75
6d, 2 inch	1 50
8d, 2½ "	1 25
10d, 3 inch and over	1 00
CASING AND BOX.	
10d to 30d	$0 75
8d	1 00
6d	1 25
4d	1 50
3d	2 50
COOPERS'.	
⅞	$10 00
¾	11 00
⅝	12 00
CUT SPIKES.	
All sizes	$0 25
BOAT SPIKES.	
All sizes	$0 75

Each half keg 10 cents extra.

TERMS.—Note or acceptance at 60 days with current rate of Exchange on S. F., or a discount of 2 per cent for cash, if remitted within 10 days from date of invoice.

All accounts when due subject to sight draft without notice.

An abatement of 10 cents per keg will be allowed upon orders of 200 kegs or over.

Coal.

PRICES "TO ARRIVE."

	Per Ton.		Per Ton.
Australian	$6 50 @6 62½	Cardiff	$7 10@ 7 12½
Liverpool Steam	6 37½@6 50	Lehigh Lump.	13 50@14 00
West Hartley	7 00 @7 25	Cumberland bk	8 00@ 8 25
Scotch Splint	0 75 @7 00	Egg, hard	10 50@10 75

SPOT PRICES.

	Per Ton.		Per Ton.
Australian	$6 62	Cardiff	$7 00
Liverpool Steam	0 50	Lehigh Lump.	14 00
West Hartley	7 50	Cumberland, bulk	8 00
Scotch Splint	6 75	Egg, hard	11 00

Iron.

PRICES "TO ARRIVE."

	Per Ton.		Per Ton.
Eglinton	$23 50	Clay Lane White	$22 00
Glengarnock	24 50	American Soft No. 1	25 50
Shotts No. 1	25 50		

SPOT PRICES.

	Per Ton.		Per Ton.
Eglinton	$23 50	American Soft No. 1	$26 00
Glengarnock	25 00	Clipper Gap, Nos. 1	
Shotts No. 1	25 50	to 5	23 50@25 50
Clay Lane White	26 00		

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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ASSESSMENTS.

COMPANY.	LOCA N.	NO.	AM'T.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Aultman M & M Co	California	2	01	June 15	July 20	Aug 10	J M Buffington	309 California st
Baker Divide M Co	California	9	25	May 12	June 15	July 6	D M Kent	330 Pine st
Best & Belcher M Co	Nevada	32	50	June 2	July 9	July 28	W Willis	305 Montgomery st
Challar M Co	Nevada	16	50	May 11	June 24	July 15	C E Elliott	309 Montgomery st
Con Imperial M Co	Nevada	22	10	May 20	June 20	July 15	C L McCoy	329 Pine st
Caledonia M Co	Dakota	16	15	May 28	July 10	Aug 5	W L Oliver	328 Montgomery st
Copper Mt Cou M Co	California	2	01	June 17	Aug 13	Sept 17	A L Perkins	310 Pine st
Eastcraft Cravel M Co	California	18	05	May 26	June 30	July 18	H Kunz	209 Sansome st
Endowment M Co	Nevada	5	50	May 19	June 22	July 20	E M Hale	327 Pine st
Golden Cate M & M Co	Nevada	2	25	June 11	July 14	Aug 1	R Hewston	314 Montgomery st
Golden Fleece C M Co	California	1	20	00	Apr 18	June 8	June 27	F Schirmeier	Phelan Block
Could & Curry M Co	Nevada	53	40	June 1	July 8	July 29	A K Durbrow	309 Montgomery st
Gold Canyon M Co	California	1	2½	June 10	July 18	Aug 4	F A Berlin	429 Montgomery st
Homeward Bound M Co	California	4	25	June 12	June 20	Aug 11	D A Smith	209 Post st
Hale & Norcross S M Co	Nevada	85	50	May 6	June 9	June 29	E B Holmes	309 Montgomery st
Iowa M Co	Nevada	17	05	Apr 29	June 6	June 27	C C Leavitt	510 Batt ry st
Murchie M Co	California	9	10	June 24	Aug 7	Aug 31	W L Oliver	328 Montgomery st
Maydower Cravel M Co	California	30	40	June 4	July 20	Aug 11	J Morizio	328 Montgomery st
Mono M Co	California	22	50	June 17	July 22	Aug 11	C W Sessions	309 Montgomery st
Navajo M Co	Nevada	11	25	May 25	June 29	July 20	J W Pew	310 Pine st
Pay Day M Co	Nevada	3	12	June 6	July 14	Aug 10	W Van Rokkeless	419 California st
Potosi M Co	Nevada	18	30	May 13	June 19	July 10	C E Elliott	309 Montgomery st
Peerless M Co	Arizona	4	50	May 18	June 23	July 17	A Waterman	309 Montgomery st
Sierra Nevada M Co	Neva a	82	25	June 9	July 15	Aug 4	E L Parker	309 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
El Dorado South Con M Co	California	D M Keut	310 Pine st	Annual	July 6
Utah S M Co	Nevada	A H Fish	309 Montgomery st	Annual	July 7

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Kossuth M Co	Nevada	C K Sturtevant	328 Montgomery st	06	Mar 16
Mt Diablo M Co	Nevada	R W Heath	318 Pine st	20	June 30
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Feb 13
Plymouth Con G M Co		W Van Norden, Pres.	23 Nassau st, N Y	50	Apr 6
Silver King M Co	Arizona	J Nash	328 Montgomery st	25	Feb 16
Syndicate M Co	Nevada	J Stadfeld Jr	419 California st	10	May 5

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING June 4.		WEEK ENDING June 11.		WEEK ENDING June 18.		WEEK ENDING June 25.	
Alpha	1.10	1.25	1.10	1.70	1.30	1.85	1.20	1.80
Alta	.30	.60	.50	.90	.50	.80	.55	.90
Andes	.45	.50	.55	.60	.35	.60	.40	.60
Argenta					.05	.10		
Belcher	1.10	1.10	1.40	1.20	1.60	1.20	1.50	
Belding								
Best & Belcher	3.35	3.95	3.70	3.95	2.45	3.75	2.30	2.90
Bullion		.40	.40	.50		.35	.40	.50
Bonanza King								
Belle Isle		.20						
Bodio Con	1.40	1.55	1.55	2.25	1.50	2.20	1.20	2.20
Beulon		.10		.15	.10	.15		.15
Bodie Tunnel								
Bulwer	.40	.45	.45	.50	.45	.55	.50	.55
California	1.60	3.15	2.50	3.45	1.90	3 25	2.00	3.35
Challenge		.25	.25	.30		.25		
Champion								
Chollar	1.80	2.45	2.25	2.65	1.45	2.50	2.10	2.75
Confidence		1.75		1.55	1.80			2.00
Con. Imperial		.10		.10		.10		
Con. Virginia	1.60	3.15	2.50	3.45	1.90	3.25	2.00	3.35
Con. Pacific								
Crown Point	1.35	1.55	1.40	2.30	1.25	1.80	1.35	1.90
Day								
Eureka Con	7.62	7.75		7.87	7.50	8.00		
Eureka Tunnel								
Exchequer		.30	.35	.40	.25	.45	.30	.45
Crand Prize				.70			.75	.80
Gould & Curry	2.00	2.35	2.15	2.35	1.40	2.20	1.45	2.55
Goodshaw		.05						
Hale & Norcross	6.75	7.37	7.12	8 25	7.00	7.75	7.25	9.87
Holmes	1.75	4.75	4.75	5.00				
Independence								
Julia		.15			.15	.20	.10	.20
Justice		.15	.15	.25	.15	.25	.20	.30
Martin White								
Mono	.90	1.25	1.00	1.40	.80	1.25	.55	1.30
Mexican	1.05	1.25	1.15	1.80	1.25	1.75	1.25	1.90
Mt. Diablo								3.00
Northern Belle								
Navajo	.90	1.30	.85	.90	.85	1.00	.90	.95
North Belle Isle		.10				.15		
Occidental		1.50	1.00	1.60		1.50		1.75
Opbir	1.30	1.75	2.00	2.75	1.60	2.25	1.60	2.30
Overman	.20	.50	.40	.65	.40	.75	.45	.70
Potosi	.70	.85	.85	.95	.85	1.05	1.05	1 35
Pinal Con								
Savage	3.60	4.20	4.00	4.80	2.75	4.60	4.00	4.85
Seg. Belcher								
Sierra Nevada	1.20	1.40	1.50	2.60	1.35	1.80	1.25	2 05
Silver Hill						.10		.10
Silver King		3.00	3.00	3.75				5.00
Scorpion	.15	.20		.20	.15	.20	.15	.25
Syndicate	.30	.40	.30	.35		.35		.40
Tioga								
Union Con	1.15	1.40	1.30	1.80	1.15	1.80	1.15	1.95
Utah			2.40	3.00	2.50	3.00	2.50	3.25
Yellow Jacket	2.55	2.75	2.70	2.80	2.35	3.00	2.35	3.10

San Francisco Metal Market.

[WHOLESALE.]

THURSDAY, June 25, 1885.

ANTIMONY—Per pound		- @	—
Hallett's		12 @	—
Cookson's		13 @	—
BORAX—Refined			54
IRON—Clengarnock ton		25 00 @	—
Eglinton, ton		23 50 @	—
American Soft, ton		26 00 @	—
Oregon Pig, ton		- @	—
Clipper Cap, Nos. 1 & 4		23 50 @	25 50
Clay Lane White		26 00 @	—
Shotts, No. 1		25 50 @	—
STEEL—English, ₱		16 @	25
Black Diamond, ordinary sizes		13 @	—
Plow		6 @	8
Machinery		10 @	12
Sanderson Bros		13 @	—
COPPER—			
Brazers' sheets		— @	25
Fire-box sheets		28 @	—
Bolt		22 @	—
Yellow Metal		12 @	14
Ingot		14 @	15
LEAD—Pig		3½@	3¾
Bar		5 @	—
Pipe		7 @	—
Sheet		8 @	—
Shot, discount 10% on 500 bag	Drop, ₱ bag.	1 85 @	—
Buck, ₱ bag		2 05 @	—
Chilled, do		2 25 @	—
TINPLATE—Oldcastle		5 25 @	6 00
Charcoal		5 75 @	6 75
ZINC—German		9 @	10
Sheet, 7x3 ft, 7 to 10 lb, less the cask		9 @	10
QUICKSILVER—By the flask		33 @	—
Flasks, new		1 05 @	—
Flasks, old		85 @	—
NEW YORK PRICES—			
California Borax, refined		8 @	8½
Pig Iron, American		17 75 @	18 50
Quicksilver		42 @	—
Lead		3 80 @	3 95
Copper		11¾@	—
Tin		22¾@	—
Bar Silver		1 06½@	—

IT is said that the Empress Carlotta is gradually regaining the proper use of her mental faculties.

LIBERAL discount allowed on filling prescriptions. C. Muller, optician, 135 Montgomery street, near Bush, opposite Occidental Hotel. x

Sales at San Francisco Stock Exchange.

THURSDAY A. M., June 25.

500 Argenta	05c	180 Could & Curry	1.65@1.70
100 Alta	60c	1870 Hale & Nor	10@10½
100 Alpha	1.30	500 Mexican	1.30
100 Alpha	1.30	500 Mono	60c
450 B. & Belcher	2.60@2.65	400 Navajo	1.20
100 Bullion	40c	150 Opbir	1.50@1.55
200 Bodie Con	1.45	350 Potosi	1.20
200 Benton	10c	1330 Savage	4.50@4.55
200 Bulwer	50c	120 Sierra Nevada	1.35
1000 Chollar	2.45	100 Scorpion	20c
650 Con Va & Cal	2.20	400 Syndicate	40c
100 Crown Point	1.40	250 Union	1.20@1.25

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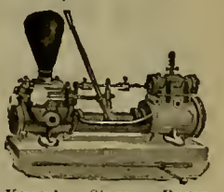

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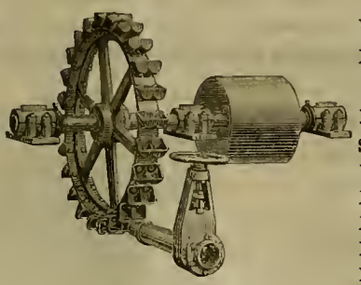

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Waters' Governors,
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Harrington's Screw Hoisting Machines
Leffel Double Turbine Water Wheel,
Pelton's Hurdy-Gurdy Water Wheel,
Babcock Fire Extingusihers and
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Carrying U. S. Mail and Wells, Fargo & Co.'s Express.

Summer Arrangement, 1885.

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In 11 Hours.

Passengers leave San Francisco daily by Ferry lines from Market Street wharf at 8 A. M., arriving at Calistoga at 11:15 A. M. Coaches leave Calistoga at 12 M. daily—Sundays excepted. On Tuesdays, Thursdays, and Saturdays leave Calistoga for Lakeport via Middletown, Glenbrook, Kelseyville, Anderson Springs and Soda Bay. Returning alternate days.

THIS IS THE MOST DIRECT LINE FROM SAN FRANCISCO TO LAKEPORT, and the most picturesque and romantic route on the Coast. From Mt. St. Helena it affords the traveler a beautiful view of the far-famed Napa and Russian River valleys and mountains of the Coast Range; and from Cobb Mountain the great Clear Lake region in front and the Pacific in the distance. This line connects with stages for ADAMS, SIGLER, and HOWARD SPRINGS and SODA BAY. On Mondays, Wednesdays, and Fridays stages leave Calistoga at 12 M. for MIDDLETOWN, GUENOC, LOWER LAKE and SULPHUR BANK, returning alternate days. This line connects at Lower Lake with stages for Seigler, Howard, Adams, and the celebrated BARTLETT SPRINGS. THESE LINES ARE STOCKED WITH SIX-HORSE CONCORD COACHES, and handled by the most careful and experienced drivers.

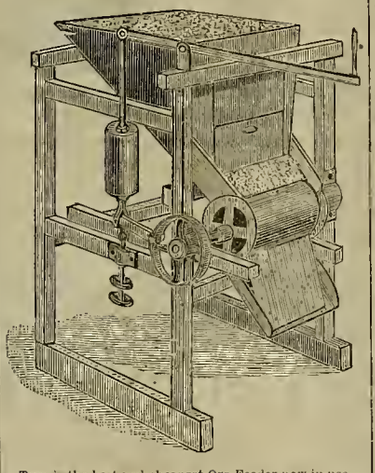
TICKETS for sale in Lakeport at W. W. Greene's Hotel, John Clark, Agent; Kelseyville, at Wells, Fargo & Co.'s office, A. A. Slocum, Agent; at C. P. R. R. office, Market Street Wharf, also at No. 2 New Montgomery Street, San Francisco, Sam Miller, Agent. Round Trip Tickets from Lakeport to San Francisco and return, TWELVE DOLLARS. Single trip tickets, $6.50.

Passengers for SODA BAY via Calistoga, purchase the Lakeport tickets for $6.50. Fare to LAKEPORT, KELSEYVILLE and SODA BAY all the same.

D. WELLINGTON, Prop.
W. N. HARLEY, Agent. Calistoga, Cal.

THE ROLLER ORE FEEDER

[Patented May 28, 1882.]



This is the best and cheapest Ore Feeder now in use. It has fewer parts, requires less power, is simpler in adjustment than any other. Feeds coarse ore or soft clay alike uniformly, under one or all the stamps in a battery as required.

In the Bunker Hill Mill it has run continuously for two years, never having been out of order or costing a dollar for repairs.

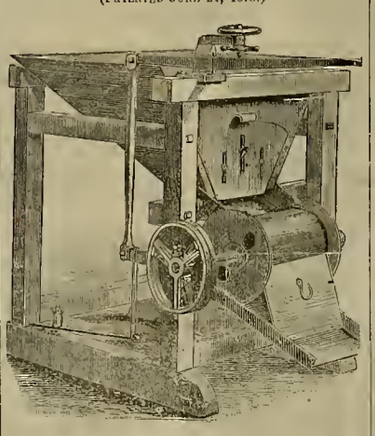
Golden State and Miners' Iron Works.

Sole Manufacturers,

327 First Street, SAN FRANCISCO, CAL

THE ORIGINAL Roller Ore Feeder.

(PATENTED JUNE 24, 1873.)



This form of Ore Feeder is well adapted for its peculiar work.

Manufacturere of the Celebrated "Challenge" Ore Feeders for wet and sticky ores; also "Stanford Improved" Ore Feedere and Tullock's Ore Feeders for dry ores.

☞ Prices furnished upon application to

JOSHUA HENDY MACHINE WORKS,

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GOLD MEDAL AWARDED
—AT—
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Automatic Cut-Off Engine.
SILVER MEDAL AWARDED
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For Beet Hoisting Engine and Boiler Combined.

W. H. OHMEN,
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22 Fremont Street,
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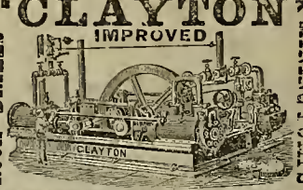

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Golden State & Miners Iron Works
Manufacture Iron Castinge and Machinery of all Kinde at Greatly Reduced Rates.
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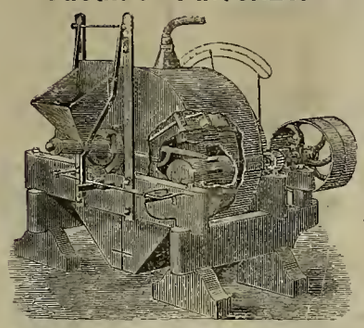
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MANUFACTURED AT
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By W. I. TUSTIN, Inventor and Patentee.
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This Coke is exclusively used by the Selby Smelting and Lead Co., Union Iron Works, Professor Thomas Price, and other consumers here. Large quantities are regularly forwarded to Copper Smelters in Arizona and New Mexico, and also to consumers in Nevada and Salt Lake.

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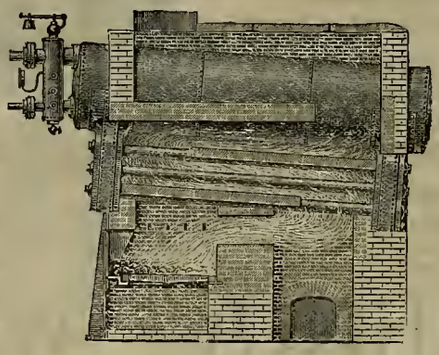
RISDON IRON AND LOCOMOTIVE WORKS.
Sole Agents for the Pacific Coast, - Corner Beale and Howard Sts., San Francisco.
FIRST PREMIUM AWARDED at MECHANICS' FAIR, 1884.

Economy in space and fuel. Safety at high pressures. Freedom from scaling. Equally adapted for power and heating purposes. Especially adapted for mills, factories, hotels, stores or any place where safety is a necessity. Will work well with muddy water and any kind of fuel.



TESTIMONIALS.

SAN FRANCISCO, Sept, 19, 1884.

Risdon Iron and Locomotive Works—Gentlemen: We have had one of your Heine Patent Safety Boilers in use for four months at our Borax Works, in Alameda. It does good work and gives perfect satisfaction. Yours truly,
(Signed) WM. T. COLEMAN & CO.

SAN FRANCISCO, Oct. 4, 1884.

Risdon Iron and Locomotive Works—Dear Sirs: I am using one of your Heine Patent Safety Boilers in my Candy Factory on Twenty-Third street, near Valencia. For economy of fuel, safety and efficiency I have never seen its equal. Very truly yours,
(Signed) W. S. TOWNSEND.

Send for Circular and Prices.

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SEND FOR 150 PAGE ILLS CATALOGUE.

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Awarded highest premiums at Cincinnati and Louisville Expositions of 1883, for "Best Automatic Engine." We will furnish anyone copies of the ORIGINAL ENTRIES of several engine builders who claim they were not competing with us. They all entered in the same class with us, and now by deceptive Circulars (one headed "Fact versus Falsehood,") attempt to mislead.
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Always First Premium in Competitive Trials.
Extra Strong and Very Durable.
Made of Best Charcoal Iron. Only One Seam. No Corners to Catch. Runs with Least Power.
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Manufactured of BEST STEAM METAL. We claim the following advantages over other Valves and Gauge Cocks now in use:

1. A perfectly tight Valve under any and all pressures of steam, oils or gases.
2. Sand or grit of any kind will not injure the seat.
3. You do not have to take them off to repair them.
4. They can be repaired by any mechanic in a few minutes.
5. The elasticity of the Disc allows it to adapt itself to an imperfect surface.

In Valves having ground or metal seats, should sand or grit get upon the seat it is impossible to make them tight except by regrinding, which is expensive if done by hand, and if done by machine soon wears out the valve, and in most cases they have to be dis connected from the pipes, often costing more than a new valve. The JENKINS Disc used in these Valves is manufactured under our 1880 Patent, and will stand 200 lbs. steam. Sample orders solicited.

To avoid imposition, see that Valves are stamped "Jenkins Bros." For sale by
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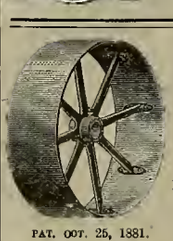

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First Premium Awarded at Mechanics' Fair, 1884.
CLOT & MEESE,
Sole Licensed Manufacturers of the
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For the States of California, Oregon and Nevada, and the Territories of Idaho, Washington Montana, Wyoming, Utah and Arizona. Lightest, Strongest, Cheapest and Best Balanced Pulley in the World. Also Manufacturers of
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Are positively unequaled for fastening **Leather, Rubber, or Cotton Belting.** THE ONLY FASTENER that will run under tighteners, on patent rolls in flour mills, and Electric Light machines **Easier to apply than Lacings and far more Economical.**

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TRY THEM! They will save you loss of TIME, TEMPER and MONEY. Manufactured by
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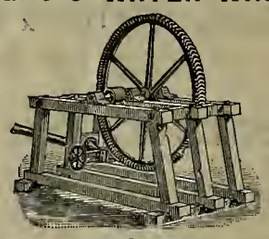

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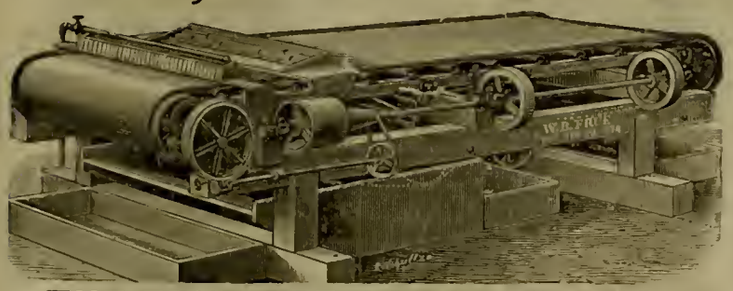

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OR VANNING MACHINE.

PRICE: FIVE HUNDRED AND SEVENTY-FIVE DOLLARS, ($575 00), F. O. B.

OVER 1,000 ARE NOW IN USE. Saves from 40 to 100 per cent more than any other Concentrator Concentrations are clean from the first working. The wear and tear are merely nominal. A machine can be seen in working order and ready to make tests at the Fulton Iron Works, No. 220 Fremont Street, San Francisco.

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The Frue Vanning Machine Company warn the public that they claim and will prove the Triumph machine to be an infringement on patents owned by them.

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N. B.—We are and have been ready at any time to make a competitive trial against the Triumph, or any other Concentrator for stakes of $1,000.

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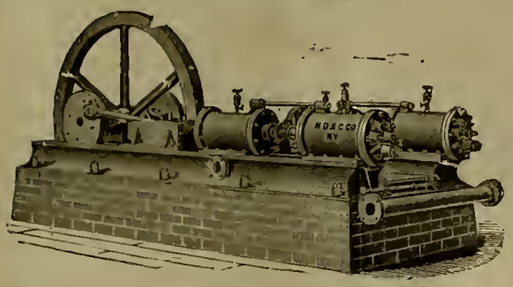
NATIONAL COMPRESSORS and ROCK DRILLS.



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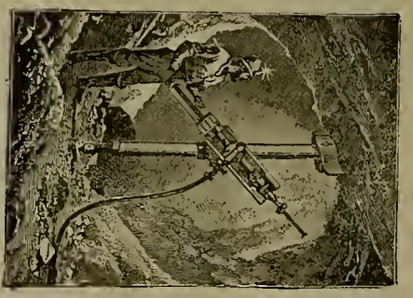
CALL AND SEE IT OR SEND FOR CIRCULARS.



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For COPPER and ARGENTIFEROUS LEAD ores of NEW and ORIGINAL DESIGNS, covered by LETTERS PATENT. No other Furnace CAN COMPARE with these for DURABILITY, and in CAPACITY for uninterrupted work. MORE THAN 150 of them are now RUNNING in various parts of THIS COUNTRY, as well as many in FOREIGN COUNTRIES, giving results NEVER BEFORE ATTAINED as regards CONTINUOUS running, ECONOMY of fuel, AMOUNT and QUALITY of BULLION produced. These CLAIMS have been PROVEN BY RESULTS in ANY NUMBER of INSTANCES, and the GREAT SUPERIORITY of this SYSTEM of smelting ores DEMONSTRATED BEYOND QUESTION. COMPLETE PLANTS furnished to order of any CAPACITY, with ALL IMPROVEMENTS that experience has DEMONSTRATED as VALUABLE in this class of work.

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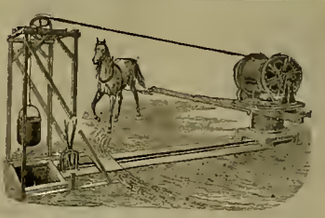
Beyond question the cheapest and most effective machine of the kind now in use adapted to all grades and classes of ores.

This machine has been THOROUGHLY TESTED for the past TWO YEARS, under a GREAT VARIETY of CONDITIONS, giving most EXTRAORDINARY results FAR IN ADVANCE of anything EVER BEFORE REALIZED. A recent COMPETITIVE TEST at the Carlisle Mine in Mexico, showed an ADVANTAGE OF OVER 30 PER CENT in favor of THE DUNCAN. The amount SAVED OVER THE FRUE being sufficient to PAY THE ENTIRE COST of the machines EVERY MONTH OF THE YEAR. One of its MOST VALUABLE features is as an AMALGAMATOR. It saves all THE AMALGAM GOLD and SILVER that ESCAPES the BATTERIES, PANS or SETTLERS, making the machine worth MORE than ITS COST for THIS PURPOSE ALONE.



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Possessing all the requirements of a first-class hoist, and affording means for the continuous operation of a Pump or Blower, without interfering with a hoisting apparatus. It is made entirely of iron, no piece weighs over 300 pounds. At the ordinary speed of a horse, a 1,000-pound bucket of ore may be raised 120 feet per minute. The hoisting-drum is under the complete control of the man of the shaft, and is capable of carrying 500 feet of five-eighths steel rope. SEND FOR CIRCULAR.

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Cast Steel Castings and Steel Forgings
UP TO 20,000 LBS. WEIGHT.

True to pattern and superior in strength, toughnees and durability to Cast or Wrought Iron in any poeition or for any eervice.

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HIGHEST PRICE PAID FOR SCRAP IRON AND STEEL.

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COMPOUND CONDENSING ENGINES,	SELF-FEEDERS,	RETORTS,
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